Summary

In this thesis, several aspects of the distribution patterns and species composition of epibenthic Peracarida (Crustacea: Malacostraca) on the South Greenland shelf were addressed. Based on material from three expeditions in 2001, 2002 and 2004, the abundance, diversity, community patterns of Peracarida and environmental factors influencing the species composition were investigated.

In chapter 1, 10 epibenthic samples taken in 2001 in depths between 106 and 251 m were investigated. In total, 59,234 specimens were collected, representing 219 species. The species belonged to the orders Amphipoda (58%), Isopoda (25%), Cumacea (11%) and Tanaidacea (5%). The peracarids represent a homogenously distributed community with respect to diversity and evenness, however, the species composition shows a clear separation into a southeastern and southwestern fauna. For this separation, discriminator species were assigned, and further analyses indicated that sediment and latitudinal gradients have major impact on the species composition and distribution. The dependency of peracarids on the sediment is explained mostly by their ecology, since most of the analysed specimens were either infaunal or epibenthic.

In chapter 2, a subset of four stations from chapter 1 was chosen and revisited in 2002 and 2004 for a study on the temporal variability of peracarid species composition. Additionally, the influence of changing environmental factors on the species composition over time was investigated. The abundance of peracarids decreased from the first to the third year, but with respect to diversity and evenness, the peracarid community was stable over the three years. Moderate changes in temperature and salinity did not affect the species composition, whereas sediment structure was found to be the most important environmental variable.

Chapter 3 describes the sampling device applied during this study. The Rauschert sledge proved to be a suitable semi-quantitative device for the sampling of epibenthic fauna. Its advantages are the small size, simple operation, high replicability and reliable sampling on different substrates.

Since sediment is an important factor for the distribution of Peracarida, nine surface samples from the South Greenland shelf were analysed for their grain size composition and

foraminiferal composition in chapter 4. The samples on South Greenland shelf banks are characterised by sandy sediments, which become coarser towards the northwestern study area. At all sample localities, the sediment was dominated by only one foraminiferal species, *Cibicides lobatulus*. The composition of sediment and foraminifers could be related to the complex hydrography of the study area, dominated by strong currents. These currents are particularly strong at those stations where coarse sediments and high abundances of *C. lobatulus* were found.

The fifth chapter investigates if the division of the peracarid fauna into a southeastern and southwestern study area is reflected on a larger scale, i.e. separating the Northeast Atlantic from the Northwest Atlantic. Using the Isopoda as an example, literature on distribution data of several North Atlantic sites from Norway, the Faeroe Islands, Iceland, Greenland, Davis Strait, East Canada and the Northern Seas was compiled for comparison with species occurrence in the material from South Greenland. The similarity between geographic sites on a medium and large scale was analysed based on their species composition. In the analyses, 231 species were included, and Desmosomatidae and Munnopsidae represented the families with the highest species richness. Some genera displayed a high degree of rare species, occurring at only one site. Multivariate analyses of species composition resulted in several clusters of sites, whereas the individual sites East Canada, Davis Strait and Northwest Greenland differed from all others. The Norwegian sites, the Faeroe Islands and South Iceland grouped to one biogeographic region, while the South Greenland sites were similar to each other and showed highest similarity to the Northern Seas and North Iceland. On this large scale, it is most likely that hydrographic conditions have a major influence on the clustering of sites.