



Latitudinal transect of benthic foraminifera size spectra in Svalbard and Norwegian fjords

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The aim of the study was to describe the variability of foraminiferal abundance in species composition along the latitudinal gradient from the northernmost Svalbard to the fjords of southern Norway. The temperature change is one of the major drivers for changes in abundance, number of species and test size of foraminiferal assemblages. Samples were retrieved at sites located along the Norwegian and Svalbard coasts. Rjipfjorden, Wijdefjorden and Isfjorden are located in the Svalbard archipelago, where the oceanographic conditions are shaped by an interplay between Atlantic water (AW) and Arctic water (ArW). Balsfjorden, Hjeltefjorden and Raunefjorden are located along the Norwegian coastline. The oceanographic conditions of Norwegian coast are shaped by two currents: the Norwegian Coastal Current (NCC) and the Norwegian Atlantic Current (NAC). Modern foraminiferal assemblages were analyzed in short sediment cores collected in 2016 from S/Y Oceania during the AREX 2016 cruise. The documentation was completed with the measurements of water temperature, salinity and turbidity.

Documentation of abundance, biodiversity and size of foraminifera tests and their relation to environmental factors are especially important in the Arctic, where effects of the global warming are predicted to occur more intensively and earlier than at lower latitudes. The results of our study indicate that the assemblages reflect a clear change between northern and southern fjords. Foraminiferal abundance and number of species increased from northernmost Svalbard fjords to southern Norway, whereas the test size showed the opposite trend – their size decreased from northern to southern fjords. Furthermore, the Bray-Curtis similarity index revealed that there are two main groups of foraminiferal assemblages - the Svalbard fjords and the Norwegian fjords. Balsfjorden although located in Norway is more similar to Svalbard fjords. Foraminiferal assemblages coming from southern Norway reflected the anoxic conditions.

Foraminifera tests size variability indicate that foraminifera adapt their size and/or number of chambers to thermal conditions. Moreover, the results allow to extend knowledge about foraminiferal distribution, what is crucial for the accurate interpretation of paleo-records.

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