Distribution and paleoecology of benthic foraminifera of Denmark Strait in Holocene and late Pleistocene

Liubov Kireenko1, Nina Kozina2, and Anna Tikhonova2

1P. P. Shirshov Institute of Oceanology, RAS, Russian Federation (boda11@yandex.ru)
2P. P. Shirshov Institute of Oceanology, RAS, Russian Federation

Holocene and Pleistocene benthic foraminifera assemblage patterns studied from 63 samples in sediment core AMK-5890 collected from Iceland's western slope in the Denmark Strait during the 71th cruise of research vessel "Academic Mstislav Keldysh" in 2018 (Novigatsky A.N, et al., 2018). Core were sampled at 1 cm interval from Holocene and 5 cm from Pleistocene and washed through a 63 micron sieve.

In the first complex of deposits represented by Holocene deposits the total benthic foraminifera abundance reaches highest values 35,000 – 60,000 individuals/g of dry sediment (ind/g of dry sed). In the lower part of the complex, abundance decreases to 10,000 ind/g of dry sed. The species diversity ranges from 25 to 35 species in the sample. Trifarina angulosa is the dominant species (about 60%). The species Cibicides lobatulus is subdominant (25-30%) in the Holocene community which lived in areas with increased hydrodynamic characteristics (Lorenz, 2005). The small group benthic foraminifera (from 2 to 15%) includes Atlantic and boreal species Cassidulina laevigata, Cassidulina neoteretis and Uvigerina peregrina (Sejrup et al, 2004). This database of distribution and ecology of benthic foraminifera indicated that in Holocene favorable living environment (positive bottom temperatures and salinity, close to modern sea), increased productivity and wide influence of Atlantic waters to the north existed. The lower part of complex reflects the epoch of deglaciation.

There are short changes in all measures at the boundary of Holocene and Pleistocene: total benthic foraminifera abundance (1000-4000 ind/g of dry sed) and species diversity (<20 species) decreases, and species assemblage is almost completely changes. It allows to identify the second complex that characterizes the transition to glacial deposits. At the top of the glacial complex, the peak of occurrence of Cibicidoides wuellerstorfi (about 25%) associates with a decrease in the influence of meltwater and active hydrodynamics (Struck, 2007). The glacial assemblage consists of two dominant species C. lobatulus (about 35%) and Cassidulina obusta (about 40%). Also, there are Cassidulina reniforme, Elphidium clavatum and Nonion labradoricum, which prefer cold waters and Arctic environmental conditions with the presence of ice cover.

Acknowledgments: Preparation, processing of samples and micropaleontological analysis was funded by RFBR, project number 20-35-90093. The expedition studies was funded by RPF, project number 14-50-00095, the primary lithological-mineralogical and geochemical studies was funded
of the State assignment of the FANO of Russia (№ 0149-2019-0007).