

Living (Rose-Bengal-Stained) benthic foraminifera along the Kveithola Trough (NW Barents Sea), environmental implications

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The distribution and composition of benthic foraminiferal fauna in the Kveithola Trough (NW Barents Sea) were studied in three depositional settings identified on the basis of surface depositional structures, sediment types and present ecosystem characteristics. Sediment samples were collected during the CORIBAR cruise (Hanebuth et al., 2013) aimed at drilling glaciogenic sediments in a palaeo-ice stream depositional system in the western Barents Sea. In particular, we report the quantitative data of the living benthic foraminiferal density, biodiversity and vertical distribution in three box-core sediment samples (0-10 cm) collected in two inner trough sites, the drift area and the channel/fault area and one outer shelf site. Rose-Bengal-stained foraminiferal assemblages were investigated from two different size fractions (63-150 and >150 micrometres). In the drift area, the living benthic foraminiferal assemblage is characterized by the presence of oxygen-depleted environmental taxa with low foraminiferal density and biodiversity. This area appears a stagnant environment, strongly affected by low-oxygen, stressed environmental conditions in which foraminifera developed a life strategy aimed to increase the efficiency of food utilization and maximum resistance to ecological stress. As a further support to this interpretation, all the sediments recovered in the drift area are rich in organic matter and in Siboglinid-like tubes together with pockmark evidences on the surface of the box-corer. The sedimentation in the channel/fault area is very similar to that described for the drift area, evidencing stressed environmental conditions. Opportunistic species dominate the benthic foraminiferal fauna. The species distribution of the internal trough sites is consistent with the lithology and with data of quantity and biochemical composition (in terms of phytopigment, protein, lipid, carbohydrate and biopolymeric carbon) of the organic matter. Values of biopolymeric carbon are typical of eutrophic setting and the presence of tolerant low oxygen condition species as *Nonionellina labradorica*, *Nonionella iridea* and *Fursenkoina fusiformis* suggests that the sediment is dysoxic. In the inner part of the trough, the presence of *Leptohalysis scottii* and the decreasing of *N. labradorica* could indicate the presence of organic carbon input with higher nutritional quality, probably due to the shallower depth of the station (151 m water depth). The site corresponding to the outer shelf is characterized by the presence of diverse and abundant benthic foraminiferal assemblage suggesting a high oxygenated and mesotrophic environment. The sedimentological evidences characterized by clean sand with large-scale ripple-like features suggest the presence of moderately strong, and persistent bottom currents. We notice in all sites the presence of delicate monothalamous taxa (organic-walled allogromiids, agglutinated saccamminids, psammosphaerids and tubular forms). Therefore, preliminary faunal and sedimentological data allow to describe sediments of the Kveithola Drift, deposited under persistent dense bottom currents, appears today as a stagnant environment strongly affected by low-oxygen concentration, possibly chemosynthetic conditions with likely ongoing gas seep activity from pockmarks.