The spatial variability of qualitative and quantitative structure of planktonic protist communities in the North Atlantic Current (the Nordic Seas)

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We investigated the spatial variability of qualitative and quantitative planktonic protist community structure in the Nordic Seas in relation to the environmental factors. Our study was conducted in the summers of 2015 and 2016 during cruises of the Institute of Oceanology PAS to the Norwegian and Greenland Seas. The samples were collected using Niskin bottles from the constant depths covering the euphotic zone (5 m, 15 m, 25 m, 35 m, 50 m) and then integrated, using trapezoidal formula, to represent protist community structure under the square meter of the water column, and fixed with an acidic Lugol's solution and, after 24hs, with a glutaraldehyde (both to a final concentration of 2%). Samples were analysed according to the Utermöhl method. The lack of a clear variability in the longitudinal-latitudinal qualitative protist community distribution was accompanied by the absence of distinct differences in the hydrography of the area. The highest total protist abundance was observed in the areas between 70-72 ºN and 74-76 ºN. The first more southerly-located peak was related to the presence of Bacillariophyceae, which numbers decreased northward, whereas the second peak was likely an effect of the increase in protist cells concentration in the frontal zones. In the longitudinal aspect, the eastward increase in Bacillariophyceae abundance was associated with the decrease in the other protist taxa. The observed communities were represented by four distinct types, distributed without any evident pattern: composed solely of Bacillariophyceae (1), Flagellates (2), Prymnesiophyceae (3) and a mixture of flagellates (Dinophyceae, Cryptophyceae) and Bacillariophyceae (4). Although our investigation seems to exclude the longitudinal-latitudinal protist zonation in the area, a further protist study under different hydrographic conditions is needed to confirm it.

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