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Benthic foraminiferal biodiversity response to the changing Arctic palaeoclimate of the last 24,000 years

J. E. Wollenburg (1), A. Mackensen (1)

Alfred Wegener Institute for Polar and Marine Research, Columbusstrasse, Bremerhaven, Germany

Investigations on the benthic foraminiferal fauna of sedimentcores from the Eurasian Basin (Arctic Ocean) continental margin, reveal well correlated biodiversity maxima and minima during the last 24 kyr. The temporal variable biodiversities observed at the core sites, on a large scale, reflect the palaeclimatic evolution of the high northern latitudes. Herein sediments deposited during interglacials and interstadials reveal highest species richness, whereas, glacials and stadials are documented by lower species numbers. In high resolution core PS2837 different periodicities in species richness in sediments from the Late Weichselian and Holocene can be detected. Biodiversity periodicities of 1.57 kyr and 0.76 kyr characterize sediments of the Late Weichselian, whereas, with the retreat of glacial ice sheets and shorter seasonal ice coverage, Holocene sediments reveal shorter periodicities of 1.16 kyr and 0.54 kyr. With the establishment of modern hydrographic conditions at about 4 kyr, a significant increase in the amplitudes of species richness can be observed.

Although sediments deposited during warmings reveal highest species richness, we doubt that water temperature determines the abundance and distribution of most benthic foraminifera in the Arctic Ocean. We rather suggest that the temporal variabilities in species richness reflect changes in the availability of food, which, in the Arctic Ocean, mainly depends on extend and duration of seasonal sea-ice retreat. In the study area the latter one, besides the seasonal varying insolation, is essentially determined by the advection-rates and temperature of Atlantic Water, entering the Arctic Ocean via the West Spitsbergen Current. Because both, flow-rate and temperature of the West Spitsbergen Current were increased during interstadials and interglacials, a

predominantely indirect influence of palaeotemperature on the biodiversity of benthic foraminifera is suggested. Yet, some rare species, like Atlantic species, may indeed have a temperature sensitive metabolism.