

BENTHIC FORAMINIFERA RECORD THE HOLOCENE MEDITERRANEAN - BLACK SEA CONNECTION

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The rise in global sea level following the last glacial maximum led to connection between the eastern Mediterranean sea and the Black sea. This connection occurred over the intervening sea of Marmara, via its two shallow straits (the Dardanells and the Bosphorus). Until now details on continuity and intensity of the oceanographic connections, based upon faunal migration, have not been presented. Shallow water benthic foraminifera can be used to define low amplitude fluctuations in Holocene sea levels and record the intensity of the interaction of the chemically differing water masses. Today, the salinity of the eastern Mediterranean sea is 39‰ compared with 17.5‰ for the Black sea. During earlier intervals in the Holocene these differences were even more pronounced.

The present study shows that there was a continuous oceanographic connection between the Mediterranean sea and the Black sea throughout the Holocene (last ~10 ka). A detailed synthesis of chronological, sedimentological, and foraminiferal data shows that six transgressive-regressive cycles in the Black sea (YANKO, 1990) can be correlated to cycles recorded during the past 8.44 ka in a sediment core from the sea of Marmara. During transgressions Mediterranean species are introduced into the Black sea via the sea of Marmara and the species diversity increased. At the same time the light, counterflowing, Black sea-derived upper water mass hindered oxygen regeneration in bottom waters. Oxygen deficiency during transgressions in the sea of Marmara is accompanied by an increase in infaunal forms, and an increase pyritization of the foraminiferal tests (up to 40%). On the contrast, regressions coincide with a decrease in species diversity in the sea of Marmara in sense the available oxygen in the bottom waters of the sea of Marmara (with resulting decrease in the pyritization and a decrease in the importance of infaunal species).

The most conspicuous transgressive stages occurred at 6.9 and 4.2 ka. A very strong regression is recorded at 2.6 ka. The response of benthic foraminiferal assemblages as defined in this study should be potentially useful in paleoceanographic reconstructions in the region.

REFERENCE

YANKO, V.. 1990. Stratigraphy and paleogeography of marine Pleistocene and Holocene deposits of the southern seas of the USSR: *Mem. Soc. Geol. Ital.*, v. 44, p.167-187.