Geophysical Research Abstracts,
Vol. 11, EGU2009-11198, 2009
EGU General Assembly 2009

Seasonal and interannual changes in zooplankton community in the coastal zone of the North-Eastern Black Sea.

A.B. Nikishina (1), E.G. Arashkevich (1), N.E. Louppova (2), and K.A. Soloviev (1)

(1) P.P. Shirshov Institute of Oceanology, RAS, Moscow, Russia (+74991245983), (2) Southern Branch of P.P. Shirshov Institute of Oceanology, RAS, Gelendgik, Russia

The phenological response of zooplankton community is a result of simultaneous effect of several factors: feeding conditions, predation abundance, periods of reproduction of common species and hydrodynamic regime. The Black sea ecosystem is one of the best studied in the world, otherwise there is still some illegibility about ecosystem functioning and especially about environmental factors influence on zooplankton dynamics. For the last twenty years pelagic system of the Black Sea has changed dramatically. The invasion of ctenophore Mnemiopsis leidyi in the middle of eighties caused significant decrease in zooplankton biomass. It also altered plankton structure and shifted periods of mass reproduction of the abundant species and biomass maximums. For instance, before the invasion of Mnemiopsis the maximum of zooplankton biomass was observed in autumn (data by A. Pasternak, 1983), and after that the maximum moved to the spring (data by V.S. Khoroshilov, 1999). The incursion of ctenophore Beroe ovata feeding on Mnemiopsis in the nineties has led to the enhancement of zooplankton community. Although the detailed analysis of seasonal zooplankton dynamics wasn't performed in the recent years.

The object of our research was to study seasonal and interannual changes in zooplankton community in the coastal area of the North-Eastern Black Sea. Analysis of interannual, seasonal and spatial changes in zooplankton distribution, abundance and species composition along with age structure of dominant populations were performed based on investigations during 2005-2008 years in the North-Eastern Black Sea. Plankton samples were obtained monthly since June 2005 till December 2008. Plankton was collected at three stations at depths 25m, 50m and 500-1000m along the transect from the Blue Bay to the open sea. Sampling of gelatinous animals was conducted in parallel to the zooplankton sampling. Simultaneously with plankton sampling CTD data were obtained. The feeding conditions were obtained using SSC satellite data. For studying vertical distribution of zooplankton depth stratified samples were collected in different seasons.

To evaluate seasonal variations in reproduction and offspring development of dominant mesozooplankton populations, we analyzed age structure of five species: four herbivorous copepods - Acartia clausi, Pseudocalanus elongatus, Paracalanus parvus and Calanus euxinus, and carnivorous chaethognaths Parasagitta setosa. Periods of mass reproduction varied in different years. The possible reason for this variation is the effect of climate change and top-predators on seasonal shift in zooplankton dynamics. Whereas timing of reproduction is related to life strategy of species, an intensity of reproduction and success of new generations depend on food supply. The impact of food conditions on abundance and age structure of herbivores was studied in the different seasons. Vertical distribution of different species also altered from year to year. Thus, in "warm" July 2007 (sea surface temperature 27ºC) most of the Calanus euxinus population concentrated in the deeper layers than in "cold" July 2005 (sea surface temperature 22ºC).