ABUNDANCE AND COMPOSITION OF ZOOPLANKTON COMMUNITIES IN THE CONTINUUM OF THE NEMUNAS RIVER, CURONIAN LAGOON AND BALTIC SEA

Monika Juodeikytė[1], Evelina Grinienė[2,3], Jūratė Lesutienė[3]

[1] Departament of Biology and Ecology Science, Klaipeda University, Lithuania,
[2] Departament of Ecology and Environmental Science, Umeå University, Sweden,
[3] Open Access Centre for Marine Research, Klaipeda University, Lithuania.

e-mail: ***monikajuodeikyte@gmail.com, evelina.griniene@apc.ku.lt, jurate.lesutiene@apc.ku.lt***

Introduction

Zooplankton is an intermediate link between primary producers and upper trophic levels. Its quantity and taxonomic composition determines the feeding conditions for fish, therefore is directly linked to fish population recruitment and balance of the food chain. Environmental degradation such as eutrophication and climate warming causes shifts of larger zooplankton species towards smaller, which potentially leads to deteriorated feeding conditions for juvenile fish. Small zooplankton species are frequently not counted in the samples provided by environmental monitoring, therefore important trends in functioning of pelagic food webs might be missed.

The aim of this study was to investigate micro- and mesozooplankton taxonomic composition, biomass, abundance in the continuum of large river delta and coastal water of the Baltic Sea.

Study site and methods

Ciliates and zooplankton samples were collected during one cruise April 2014. The stations were chosen to form the gradient along Nemunas river-Curonian lagoon-Baltic Sea (Fig. 1). Zooplankton samples were taken and analyzed according HELCOM (2005) recommendations. Ciliate counts were performed in Lugol fixed samples by Utermöhl's (1958) method.

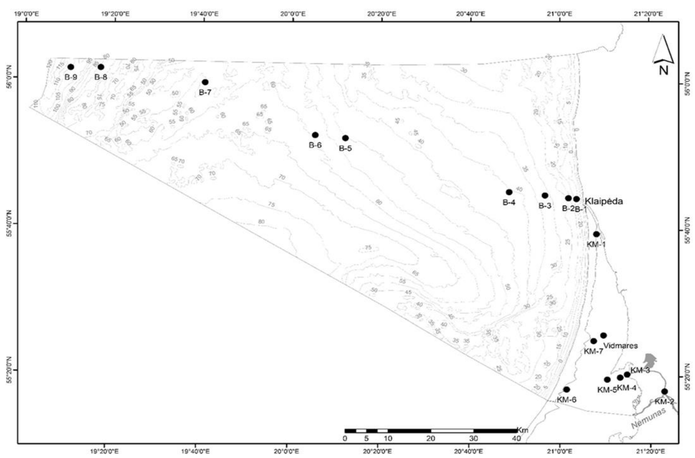
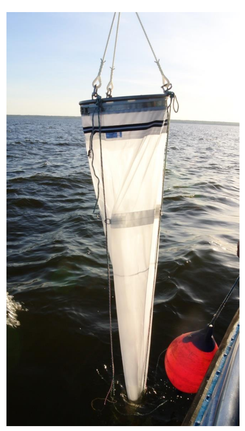


Fig. 1. *Location of the sampling stations in Nemunas river, Curonian Lagoon and the Baltic Sea.*



Results

Three groups of samples: Nemunas River avandelta, Curonian Lagoon and Baltic Sea were distinguished by ordination (MDS) on the basis of similarity of zooplankton and ciliate community structure (Fig. 2).

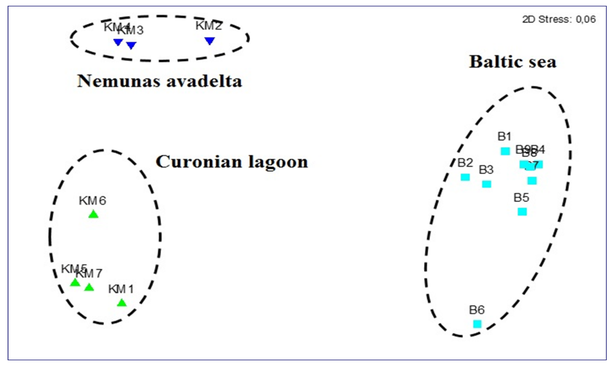


Fig. 2. *The MDS plot based on zooplankton and ciliates taxa biomass data*

Zooplankton biomass increased from Nemunas river avandelta towards the Baltic sea. Community shift from cladocerans in the Curonian Lagoon to rotifers in the Baltic sea was observed (Fig. 3).

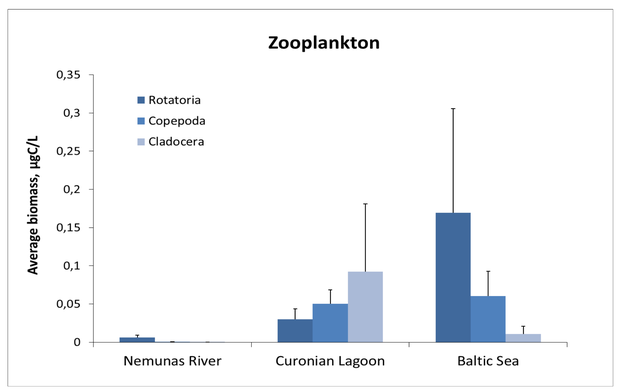


Fig. 3. *Average rotifers, cladocerans and copepods biomass in Nemunas river avandelta, Curonian Lagoon and Baltic sea sites.*

Ciliate biomass tend to decrease from Nemunas river avandelta stations towards the Baltic sea, but this pattern was less pronounced compare to zooplankton biomass (Fig. 4).

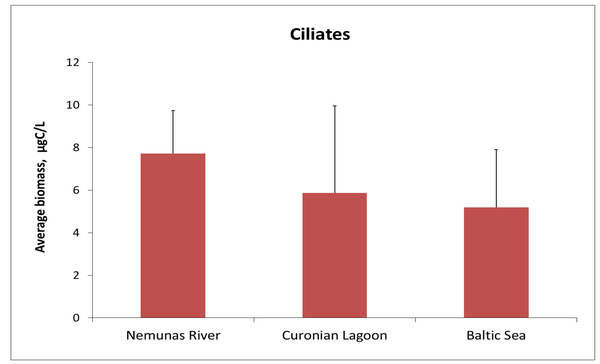
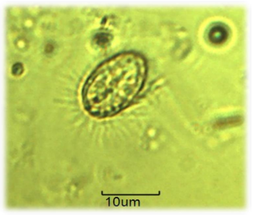


Fig. 4. *Average ciliate biomass in Nemunas river avandelta, Curonian Lagoon and Baltic sea sites.*

Lohmaniella oviformis



Cyclidium sp.

Conclusions

- Ciliate biomass was 1-3 order of magnitude higher compare to zooplankton biomass
- Ciliate relative importance in a total zooplankton community was highest in the river avandelta and lowest in the sea.
- Zooplankton community was homogeneous in the sea, without notable effects of plume zone.