

# THE SPATIAL ZOOPLANKTON DISTRIBUTION IN THE NORTH – WESTERN BLACK SEA REGION: SPRING AND AUTUMN, 2008

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## Abstract

The seasonal distribution of zooplankton community in the NW part of Black Sea have been assessed regarding on the variability of numerical abundance and biomasses as well as the vertical patterns of distribution in the water column. The results are based on 66 quantitative samples collected within SESAME international projects carried out in 2008. 28 taxa belonging to 13 systematic groups have been found. The greatest number of species had Crustacea Class while *Noctiluca scintillans* was remarked for its density.

**Keywords:** Zooplankton, Vertical Profile, Black Sea

## Introduction

Climate change affects in many ways the response of marine ecosystem biota. Temperate marine environments may be particularly vulnerable to these changes because the recruitment success of higher trophic levels is highly dependent on synchronization with pulsed planktonic production [1]. SESAME aims was to assess and predict changes in the Mediterranean and Black Sea ecosystems as well as changes in the ability of these ecosystems to provide goods and services.

## Materials and methods

During April and September 2008, have been collected 66 quantitative samples of zooplankton in 9 stations in the NW part of Black Sea (between 44°46' N and 42°29' N latitude and 28°64'E and 30°59'E longitude). The sampling was performed using a Hensen zooplankton net with mouth area 0.384 m<sup>2</sup>, and mesh size 125µm. The vertical profile included 6 or fewer intervals of depths (0-10, 10-25, 25-50, 50-100, 100-150, 150-200 m) between isobaths of 15 m inshore to 2000 m offshore. Sampling volume was estimated by multiplying the mouth area with the wire length.

## Results and Discussion

There where identified 24 taxa: 1 Dinophyceae, 2 Rotifera, 3 Ctenophora, 4 Branchiopoda (Cladocera), 8 Crustacea (Cirripedia – 1, Calanida – 6, Cyclopida – 1), Chaetognata – 1, Tunicata – 1 and meroplanktonic larvae (Polychaeta, Gastropoda, Bivalvia, Decapoda). Their populations have registered an average density of 703.15 ind.m<sup>-3</sup> and an average biomass of 52.34 mg.m<sup>-3</sup>. The numerical structure of zooplankton communities was composed by 63% Crustacea (34% Calanida, 27% Cladocera), 18% Dinophyceae, 12% Rotifera, 2% Tunicata.

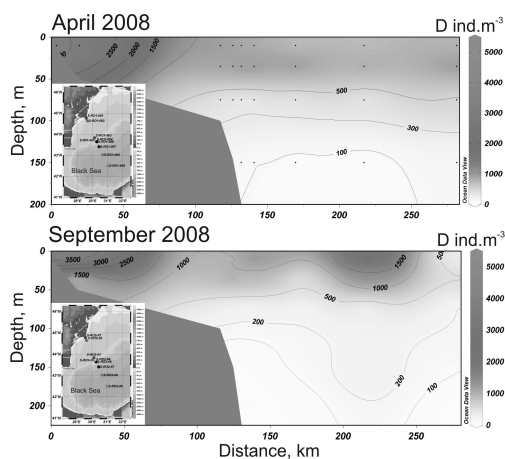


Fig. 1. Average density of zooplanktonic populations' distribution in the water column in the area investigated

The analysis of taxonomic groups evidenced the numerical dominance of copepods and cladocerans. Of these, 8 species were most abundant, comprising almost 86% of the total average density. These are *Noctiluca scintillans*, *Penilia avirostris*, *Pleopis polyphaemoides*, *Acartia clausi*, *Pseudocalanus elongatus*, *Paracalanus parvus*, *Calanus helgolandicus* and

*Synchaeta littoralis*. In both seasons was evinced a greater diversity in September (22 taxa) than in April (14 taxa). Opposite, the numerical abundances were greater in spring (752.96 indv.m<sup>-3</sup>) than in autumn (667.6 indv.m<sup>-3</sup>), due to Danube debits which positively influenced the abundance of planktonic populations through nutrients aport for phytoplankton and rotifers proliferation. Distribution in the water column down to 200m deep in both seasons evidenced that the diversity and also numerical abundance (2,350 ind.m<sup>-3</sup>) were highest in the surface layer (50-0m) in April (Fig. 1). *N.scintillans*, *S.littoralis*, *P.avirostris*, *P.polyphaemoides* and *A.clausii* were the main species that formed the littoral nucleus. These species has a great adaptation potential and quickly response related to climate factor variability, their proliferation being enhanced by the blooming events and warming tendency. In September the highest densities recorded (1,867 ind.m<sup>-3</sup>) were distributed in the first 25m depths.

In the ecological conditions of April 2008, vertically distribution of zooplankton had maximum biomasses in 100-50 m layer while that in September at 50-0 m depth. This suggests that in September was still a suitable temperature for populations of zooplankton, which mainly develop in summer season. *N. scintillans*, *C.helgolandicus*, *Pleurobrachia rhodopis*, were the dominant species after biomass (Fig.2).

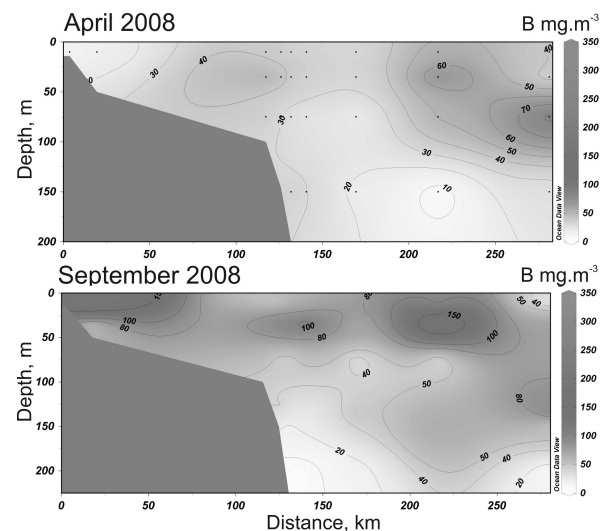


Fig. 2. Average biomass of zooplanktonic populations' distribution in the water column in the area investigated

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## References

- 1 - Cushing, D. H., 1990. Plankton production and year-class strength in fish population: an update of the match/mismatch hypothesis. *Adv. Mar. Biol.* 26: 250–293.