

## ZOOPLANKTON STRUCTURE IN THE MARMARA SEA IN AUGUST 2000

Melek Isinibilir \* and Ahmet N. Tarkan

Istanbul University, Fisheries Faculty, Laleli, Istanbul, Turkey - \* melekis@istanbul.edu.tr

### Abstract

Quantitative composition and abundance of zooplankton have been investigated in the Marmara Sea. Samples were collected at 9 stations, from 1 to 9 August, 2000. *Noctiluca miliaris* was the dominant species, with maximum density reaching 217779 ind/m<sup>3</sup>.

**Keyword:** *Noctiluca miliaris*, Mesozooplankton, Marmara Sea

### Introduction

The Marmara Sea, a small intercontinental basin with a total volume of 3378km<sup>3</sup>, carries the less saline Black Sea (17-18ppt) water into the Aegean Sea in the upper layer, and the more saline Mediterranean Sea water (39ppt) into the Black Sea in the lower layer via the Turkish Straits (1). Although recently some studies were made on the zooplankton structure of the Turkish Black Sea (2), there have been few investigations on zooplankton of the Marmara Sea (3, 4). In this study, quantitative composition and abundance of zooplankton have been investigated in August 2000.

### Material and methods

Material was collected at 9 stations from 1 August till 9 August, 2000 (Fig.1). Samples were taken vertically with a 200 µm, 57 cm diameter, WP2 plankton net. All zooplankton samples were preserved in 4 % buffered formaldehyde. The jellyplankton samples were identified and counted onboard.



Fig. 1. Location of sampling stations in the Marmara Sea.

### Results and discussion

The zooplankton was separated into three main groups: macrojellyfish, mesozooplankton and *Noctiluca miliaris*, because of its enormous quantity. In the Marmara Sea, macrojellyfish consist of *Mnemiopsis leidyi*, *Pleurobrachia pileus* and *N. miliaris* in this study. While *M. leidyi* was sampled in all stations, *Aurelia aurita* was found only at two stations. While the maximum number of *P. pileus* was observed at the first station as 1,33 ind/m<sup>3</sup>, the maximum number of *M. leidyi* was recorded at the seventh station (26,66 ind/m<sup>3</sup>).

The zooplankton of the Marmara Sea was found to consist of five groups. These were the Copepoda, Cladocera, meroplankton, *N. miliaris* and "Others" consisting of *Appendicularia*, *Chaetognatha* and Foraminifera. Compared to all other zooplankton groups, *N. miliaris* were the dominant taxon (Fig.2): in August 2000 it made up 99,9 % of the mesozooplankton at the first station with the maximum density of 217779 ind/m<sup>3</sup>. This species was dominant as well in stations 2,3,4 and 6, while it was not found at the stations 8 and 9, situated at the far west.

The maximum abundance of Cladocera (5950 ind/m<sup>3</sup>) was recorded at the station 8, in center of Çanakkale Strait, where the lowest number of *Mnemiopsis* occurred. Copepoda are dominant marine zooplankton (5), but came third in 30m water masses of the Marmara Sea in August 2000. In 1977, the abundance of zooplankton in the northern Marmara was 284 ind/m<sup>3</sup> (3). In August 1992, the

zooplankton was drastically reduced to 33 ind/m<sup>3</sup> in the northern Marmara (4). In this study, the mesozooplankton increased in the northern Marmara to 3050 ind/m<sup>3</sup>. Long term trends show fluctuation of mesozooplankton in the Marmara Sea. In recent years the water quality of the Sea deteriorated due to continual increase in the input of nutrients and pollutants. As a result, the zooplankton community structure has changed and the density of *N. miliaris*, a pollution tolerant species, increased. This result is consistent with previous studies conducted in the Black Sea (7).

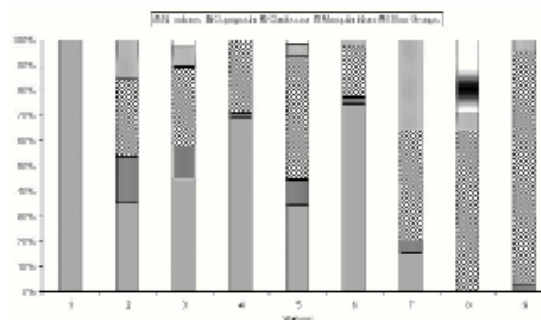


Fig. 2. Percentage of zooplankton groups.

### References

- 1-Benli H., Tarkan A.N., Sever T.M. 2001. Comparison of the mesozooplankton composition the southwestern Black Sea, Sea of Marmara and eastern Aegean Sea. Turkish J. Marine Sciences, 7: 163-179
- 2-Kideys A.E., Kovalev A.V., Shulman G., Gordina A., Bingel F. 2000. A review of zooplankton investigations of the Black Sea over the last decade. J. Marine Systems, 24: 355-371.
- 3-Cebeci M. and Tarkan, N. 1990. Distribution of zooplankton organisms in the Marmara Sea. I.U. Su Urunleri Dergisi 4(1): 69.
- 4-Shiganova, T. A., A. N. Tarkan, A. Dede, & M. Cebeci, 1995. Distribution of the ichthyoplankton *M. leidyi* (Agassiz, 1865) in the Marmara Sea (October 1992). Turkish J. Marine Science, 1: 3-12.
- 6-Unal E., Shmeleva A.A., Zagarodnyaya J., Kideys A. 2000. Zooplankton structure and copepod species of the Sea of Marmara in spring 1998. Pp. 493-499. In: Oztürk B., Kadioglu M. and Oztürk H. (eds.), The Symposium of The Marmara Sea 2000, TUDAV. Istanbul (in Turkish).
- 7-Zaitsev Yu.P., Polishchuk L.N., Nastenko E.V., Trofankhuk G.M. 1988. Very high concentrations of *Noctiluca miliaris* Suriray in the neustal layer of the Black Sea. Doklady Acad. Nauk Ukr. SSR, 10: 67-69.