

# ABUNDANCE AND DISTRIBUTION OF *MNEMIOPSIS LEIDYI* IN THE NORTHERN MARMARA SEA

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## Abstract

The abundance and distribution of *Mnemiopsis leidyi* in the Northern Marmara Sea was studied on 1-9 August 2000. The samples were collected by vertical towing. *M. leidyi* was sampled from all of the 11 stations where the abundance varied between 0.2-25.1 ind./m<sup>3</sup>.

**Keywords:** *Ctenophora*, Sea of Marmara, Biomass

## Introduction

The Marmara Sea is an interior sea which establishes the Turkish Straits System together with the Bosphorus and Dardanelles Straits. It is directly connected to the Black Sea with the Bosphorus, therefore the upper layer (0-20m) is strongly under the influence of the Black Sea water. *Mnemiopsis leidyi* is an exotic species to the Black Sea, which might have been carried by ballast waters of ships passing through, and caused great changes to the ecosystem of the Black Sea (1). It spread out the entire Black Sea in 1989 and afterwards it was determined in the Marmara Sea in huge quantities in 1992 (2). In this study, the abundance of *M. leidyi* in August 2000 was studied in the Northern Marmara Sea, and was compared with the former years.

## Material and Methods

The presence of *M. leidyi* in the Northern Marmara Sea and Dardanelles was investigated with R/V *Yunus* on 1-9 August 2000. The samplings were made at 11 station (Fig.1). The samples were collected by vertical towing of a WP2 plankton net with a diameter of 57 cm and 200 µm between the sea surface and the lower layer where waters of the Black Sea and the Mediterranean Sea mix. The jellyplankton samples were identified, measured and classified in three length groups (I ≤ 10mm, I=10-45mm, I > 45 mm) immediately on the board. The wet weight was computed by the formula  $W=2,36xL^{2,35}$  where W is the weight and L is the length of *M. leidyi* (1).

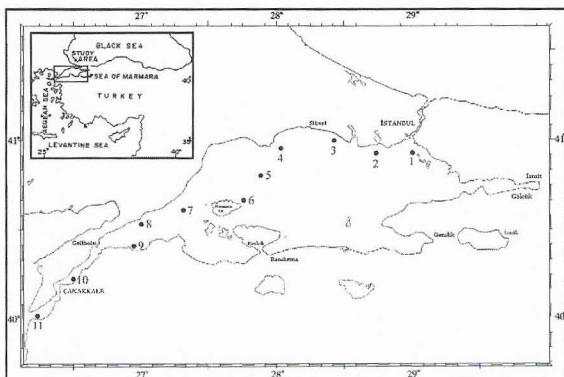


Figure 1. Location of sampling stations in the Northern Marmara Sea.

## Results

In total, 865 individuals were counted at the 11 stations in the Northern Marmara Sea and Dardanelles. *M. leidyi* which was detected at every station, was 50mm at maximum in length. While the maximum biomass was measured at the third station (125.11 g/m<sup>3</sup>), the maximum abundance was recorded at the seventh station (25.1 ind/m<sup>3</sup>) (Fig.2). Near the Bosphorus, biomass varied between 14.6-38.4 g/m<sup>3</sup> whereas near the Dardanelles ranged between 1.14-30.9 ind/m<sup>3</sup>.

Although samples of three separate length groups were found, the individuals of the small and medium size were more abundant. Small size specimens (I≤10mm) comprised 54.45 % of the total quantity, the second-medium size (I=10-45mm) with 45.31 % and the large ones (I>45mm) constituted the remaining 0.24 %. At two stations located in the Dardanelles merely 32 medium size individuals were detected.

Beside *M. leidyi*, *Pleurobranchia pileus* was found at seven stations, while *Boreo ovata* was not detected anymore, and medusa *Aurelia aurita* were sampled only at two stations.

## Discussion

There are a few studies about the abundance of *M. leidyi* in the Marmara Sea. In another study made at the Black Sea the maximum abundance of *M. leidyi* was determined as 31 ind./m<sup>3</sup> (1) whereas it was >50 ind./m<sup>3</sup> in its natural habitat at the Narragansett Gulf in the northeastern region of USA (3). In the Northern Marmara Sea, the total abundance of *M. leidyi* (0.2-25.1 ind./m<sup>3</sup>) was found much lower than as in the Black Sea and Narragansett Gulf.

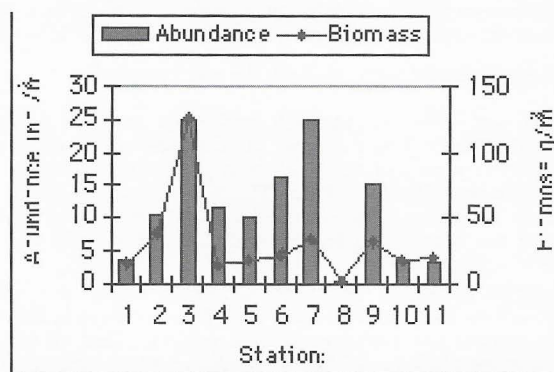


Figure 2. Abundance and biomass of *Mnemiopsis leidyi* at sampling stations in the Northern Marmara Sea.

In 1992, the small and medium size specimens prevailed at all stations and near the Bosphorus, biomass was 68-100 g/m<sup>3</sup>, near the Dardanelles it reached 159 g/m<sup>3</sup> at the Marmara Sea (2). In this study, the small and medium size individuals were highly dominant at all stations. The average biomass was 14.64-38.39 g/m<sup>3</sup> near the Bosphorus and 1.14-30.9 g/m<sup>3</sup> near the Dardanelles. As shown by these parameters, a decrease was observed in the abundance of *M. leidyi* in the Marmara Sea.

The abundance (3.23 ind/m<sup>3</sup>) and biomass (19.93 g/m<sup>3</sup>) of *M. leidyi* recorded in the Southern Bosphorus in July 2000 (4) were similar to the parameters near the Bosphorus (3.6 ind/m<sup>3</sup>; 14.64 ind/m<sup>3</sup>) in this study. Although the abundance of *M. leidyi* determined in the Dardanelles was 0.002-0.073 ind/m<sup>3</sup> (5), it was found as 3.4 ind/m<sup>3</sup> in this research. The difference between the values could be caused by the different sampling method and current systems.

The low saline surface currents of the Black Sea is continuously carried to the Marmara Sea and because of this reason, it is considered that *M. leidyi* which is found in the Black Sea at every season (6) passes to the Marmara Sea with this currents. (2,4). As a result, one can conclude that the abundance of *M. leidyi* in the Northern Marmara Sea decreased, population of *M. leidyi* is rather young and there is intensive reproduction in August because of suitable temperature and food. As *M. leidyi* feeds on mesozooplankton, eggs and larvae of fishes (7), it is going to be harmful for the upper layer of the Marmara Sea. Thus, the abundance and distribution of *M. leidyi* in this area has to be monitored closely because of this reason.

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