

# LONG TERM TRENDS IN THE DISTRIBUTION OF *MNEMIOPSIS LEIDYI*, AGASSIZ 1865, IN THE SEA OF MARMARA

Ahsen Yuksek \*, Erdođan Okuř , I. Noyan Yılmaz and Nazli Demirel

Institute of Marine sciences and Management, Istanbul University, Muskule Sok. No:1, 34116, Vefa, Istanbul, Turkey - ayuksekk@istanbul.edu.tr

## Abstract

The distribution of *Mnemiopsis leidyi* Agassiz, 1865 in the Sea of Marmara was examined in 1995-2006. It has been observed that biomass and abundance of *M. leidyi* decreased sharply at the end of the decade.

**Keywords :** *Sea Of Marmara, Zooplankton, Ctenophora.*

The ctenophore *Mnemiopsis leidyi* Agassiz, 1865 was introduced to the Black Sea in ballast waters in the early 1980s [1] and adversely affected the Sea of Marmara ecosystem [2]. This study investigated the long term distribution of *M. leidyi* in the Sea of Marmara. Samples were collected at 63 stations in the Sea of Marmara between 1995 and 2005, using a Nansen closing net (1 m diameter, 500  $\mu$ m mesh) vertically. At the end of each tow, the ctenophores were sorted, counted and their volume measured using an Imhoff cone. *Mnemiopsis leidyi* was considered the main reason for the collapse of Black Sea ecosystem in mid 1980s. Its distribution decreased significantly in the years 1995-2005 (Fig. 1). The monthly biomass and average volume of individuals increases in July and reaches its highest values in September (Fig. 1). The number of large individuals was higher in October and November (Fig. 1). The species distribution is usually limited to the upper water layer of the Sea of Marmara.

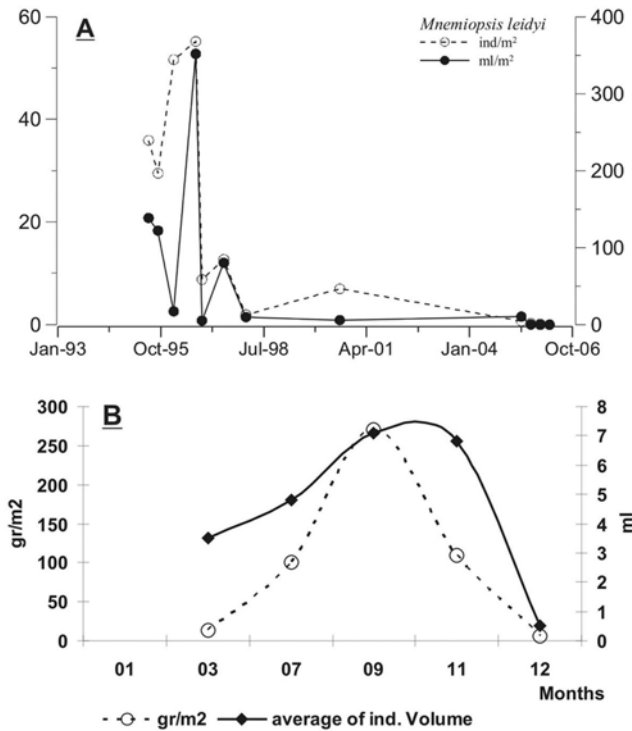


Fig. 1. A) Abundance and biomass distribution of *M. leidyi* in different years; B) Monthly changes in biomass and average individual volume of *M. leidyi*.

The highest density was found around Istanbul Strait, Dardanelles and Erdek Bay in 1995. However, in 1996 high densities were observed through the basin (Fig. 2). The stocks decreased significantly in 2000s and they were mostly confined to north part of the basin. The highest frequencies were observed between 1995 and 1997. Significant decrease in abundance and frequency was detected in the end of August 2000, and decreased further to less than %5 in 2005. Values decreased more than 300 times between March 1996 and March 2006 (Fig. 1, 2). Additionally abundance of *M. leidyi* decreased 73 times between December 1996 and December 2006 (Fig. 2).

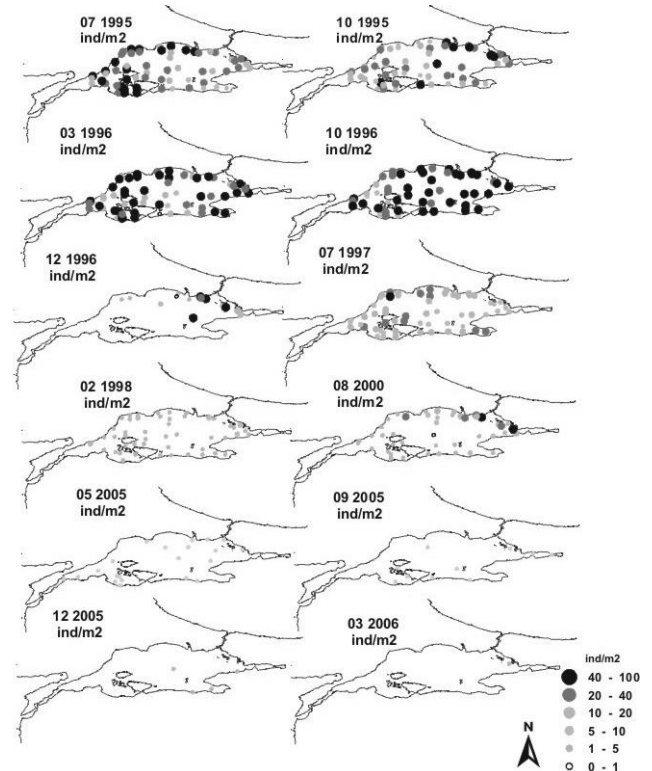


Fig. 2. Distribution of *M. Leidyi* per unit area in different years.

The sharp collapse in demersal fish stocks in the Sea of Marmara in 1994 has been associated with enormous increase of *M. leidyi* [3]. Mesozooplankton and ichthyoplankton was adversely affected [2]. Eggs of the planktivorous anchovy were at the lowest levels in 1994 [4]. It has been also noted that the abundance and number of ichthyoplankton species increased rapidly following the sharp decline in *M. leidyi* density [4].

## References

- Shiganova T.A., 1997. *Mnemiopsis leidyi* abundance in the Black Sea and its impact on the pelagic community. In: Ozsoy, E., Mikaelyan, A. Eds., Sensitivity to Change: Black Sea, Baltic Sea and North Sea. Kluwer Acad. Publ., pp. 117-130.
- Okus E., Yuksek A., Uysal A., Orhon V., Altiođ H., Oztürk, S. and Camurcu O., 1998, Marmara Denizi'nde teleost balıkların pelajik yumurta ve larvalarının tespiti ve bolluđu. IUDBIE, Sunulan Kurum: TUBITAK.
- Okus E., Yuksek A., Uysal A. and Orhon V., 1994. Marmara Denizi'nde bazı ekonomik demersal balıkların stok tayini (1990-1994). IUDBIE, Sunulan Kurum: TC Tarım ve Koy İsleri Bakanlıđı ve TUBITAK.
- Demirel N., 2004. Marmara Denizi'nde Bulunan Teleost Balıkların Pelajik Yumurta ve Larvalarının Dađılımi ve Bolluđu (Ađustos 1994-Temmuz 1997-Ađustos 2000). Yuk. Lis. Tezi. Danıřman; Ahsen YUKSEK. Den. Bil. ve İsl. Enst., Istanbul. 73 s.