

PRELIMINARY NOTE ON THE OCCURRENCE AND BIOMETRY OF CTENOPHORAN *Mnemiopsis leidyi* FINALLY INVADED MERSİN BAY

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ABSTRACT: Presence of Ctenophoran *Mnemiopsis leidyi*, endemic of the Atlantic coast of North America, is now being reported from the north-eastern coast of Mediterranean for the first time. This preliminary report gives a brief summary of its morphology, and significance in addition to its biometry. For biometric conversion in addition to morphometric measurements (Total length, auricle length and mouth length) total wet weight and volume were measured.

Key words: Ctenophore, *Mnemiopsis leidyi*, Mersin Bay, biometry, weight-volume-length relationship

MERSİN KÖRFEZİNİ SONUÇTA İSTİLA EDEN KTENOFOR *Mnemiopsis leidyi*' NİN BİYOMETRİSİ VE BULUNURLUĞU ÜZERİNE PRELİMİNER NOT

ÖZET: Kuzey Amerikanın Atlantik kıyılarındın endemik türü *Mnemiopsis leidyi*'nin kuzey-doğu Akdenizde bulunurluğu ilk kez rapor edilmektedir. Bu ön rapor, bu türün biyometrisi yanısıra önemi ve morfolojisi üzerine kısa bir özetini içermektedir.

Biyometrik çevrimler için morfometrik ölçümlerin (toplam boy, auricle boy ve ağız boyu) yanısıra toplam yaş ağırlık ve hacim ölçülmüştür.

Anahtar Kelimeler: Ktenofor, *Mnemiopsis leidyi*, Mersin Körfezi, Biyometri, Ağırlık-Hacim-boy ilişkisi.

INTRODUCTION

Ctenophora is a small phylum of marine animals that are commonly known as sea walnuts or comb jellies. They are distinguished from jellyfish (Coelenterata) by having a definitely developed mesodermal layer of cells in which within this intermediate layer lie specialized mesodermal muscles (1). All the adult form are the members of the macroplankton,

ranging from few millimeters up to 20 cm. Approximately 90 species are included in this phylum and *Mnemiopsis* and *Pleurobrachia* are endemic along the north Atlantic coast (2). *Mnemiopsis* inhabits both oceanic and brackish waters.

In recent years, much attention has been directed toward ctenophores (comb-jellies) which forms an important population of carnivorous predators in coastal waters and estuaries. *Mnemiopsis leidyi*, besides a high rate of fecundity (3) feeds on a variety of organisms and appears to have played a major role in the recent changes in the Black Sea ecosystem, and even the drastic reduction of major pelagic fish stocks in Black Sea (4). A large volume of data have been gathered on its presence in Black Sea following its first invasion in 1987. Forming dense swarms they have great ecological importance in reducing the number of fish fry (5), copepods, jellyfish, sagittas and all smaller planktic animal forms. It is alarming that its total biomass in Black Sea has been estimated approximately 800 million tonnes (6).

The aims of this paper are to present preliminary observations on *Mnemiopsis leidyi*'s morphology and biometry for comparison with those obtained for other locations in various seas and its recent acclimitization to the region.

MATERIAL AND METHOD

The live specimens of *Mnemiopsis leidyi*, were collected manually from the Institutes' harbour (Figure 1) from a small boat. A total of 51 specimens were collected and gently placed into large glass jars to avoid possible deformations on the body. No fixation and preservation were done throughout the collection and analysis of the individuals. To prevent problems such as contraction, break-up, or shredding of the body associated with such procedure (1,7), individuals were kept alive until all measurements were performed immediately after sampling.

Volume measurements were done prior to weight and morphometric parameters. Volume of each individual in a fine graduated cylinder was measured by pouring additional 10 ml sampled sea-water for accurate reading in a medium free of air bubbles. Next step was determination of live wet-weight on an analytical balance with precision of .01 g after removing all supernatant water. Three different size measurements (lobe= total length; auricle length; mouth length) were made (Figure 2). Specimens laid on a glass petri dish with lobes almost at the same position as they are in the sea for accurate measurements with a ruler.

For statistical treatment of morphological and biometric measurements Statgraphics package programme was utilized. Prior to the calculation of length-weight relationship via simple regression, raw data was log transformed (base 10) (curvilinear relationship do exist in between both parameters). No transformation is required for regression of weight on volume.

RESULTS AND DISCUSSION

The largest size (length without lobes) was found to be about 70 mm reported for the Narragansett Bay (8) and 75 mm (body length) for the Black Sea (4). Maximum length was given 100 mm (3) which coincides well with the maximum length found in the present study.

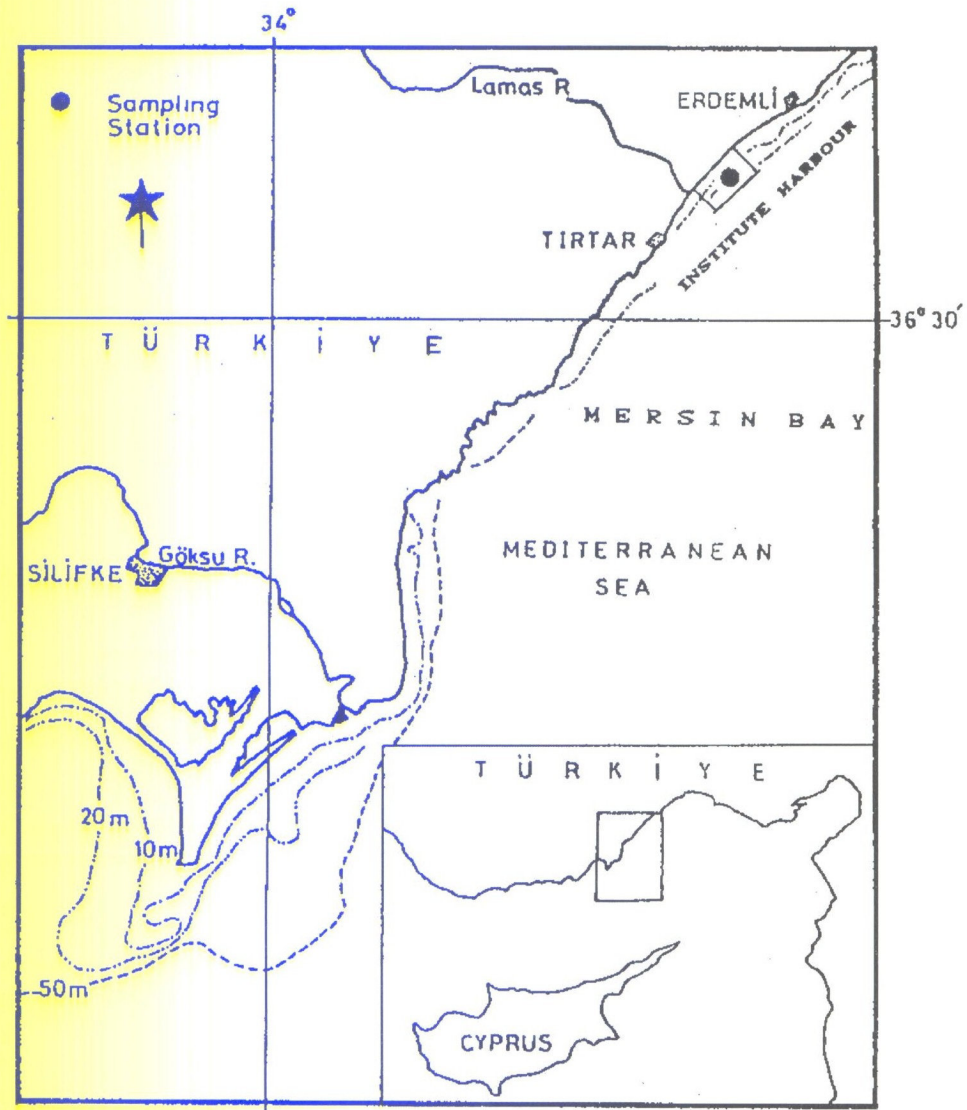


Figure 1. Map showing the sampling site invaded by the Ctenophore, *Mnemiopsis leidyi* for the first time

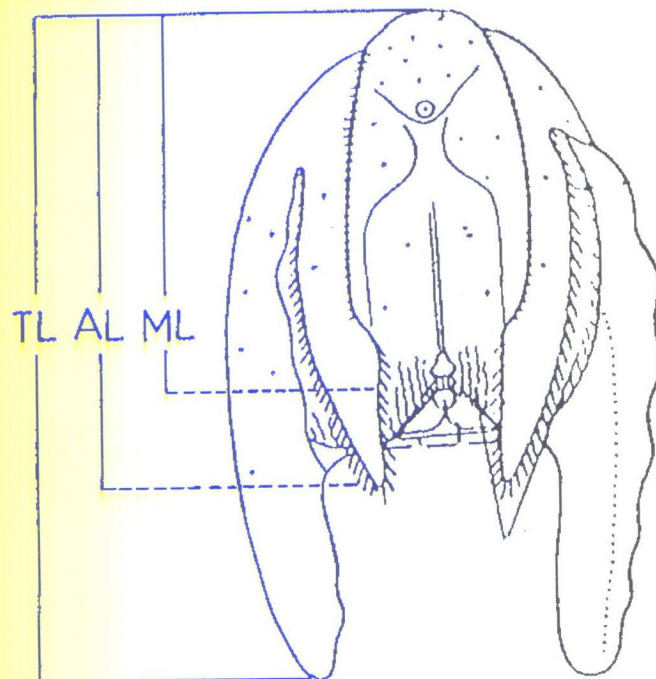


Figure 2. Morphometric measurements performed on the individuals.

Following are the tabulated information for the volume-weight-length raw data set (Tables 1&2).

Table 1. Basic Statistical information for raw data.

Variables	Volume (ml)	Weight (g)	AL (cm)	ML (cm)	TL (cm)
Sample size	51	51	51	51	51
Average	12.44	11.27	11.27	3.51	5.36
Variance	35.59	34.46	34.46	0.54	1.41
Standard dev	5.97	5.87	5.87	0.73	1.19
Minimum	4.3	3	3	2	3.5
Maximum	39.8	37.5	37.5	5.8	10

AL = Auricle Length ML = Mouth Length TL = Total Length

Table 2. Correlation coefficient values calculated for morphometric measurements. ($p < 0.01$)

	Total Volume	Total Length	Auricle Length	Mouth Length
Total weight	.9981	.9619	.8866	.8830
Total volume	----	.9606	.8783	.8742
Total Length	.9606	----	.9000	.8963
Auricle Length	.8783	.9000	----	.9932
Mouth length	.8742	.8963	.9932	----

Following are the equations (from figures 3,4,5,6) which summarize the relationship between biometric measurements of *Mnemiopsis leidyi* from the Mersin Bay. Relationships between all the measurements in a matrix form is given in Figure 7.

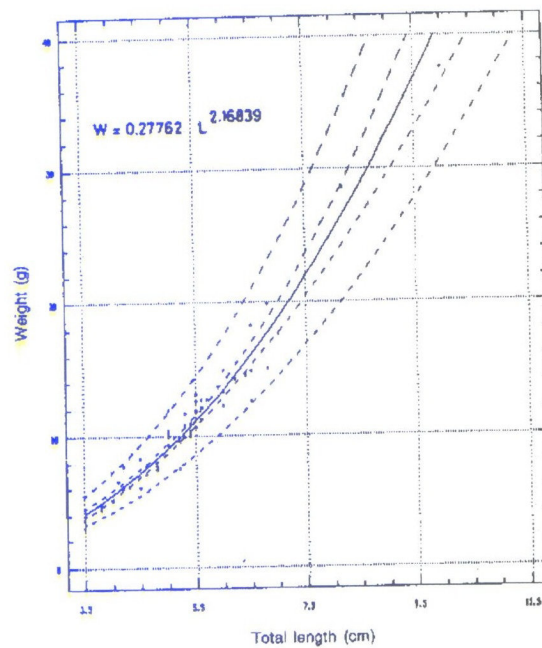


Figure 3. Regression of weight on total length. ----Best fit: --- (Confidence limits %99-%95)

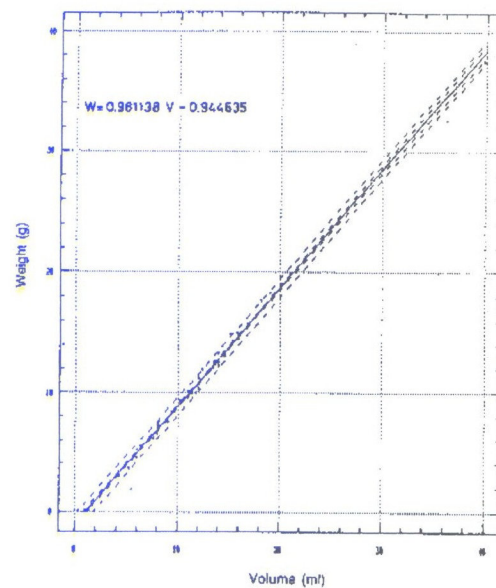


Figure 4. Regression of weight on volume. ----- Best fit : --- (Confidence limits %99-%95)

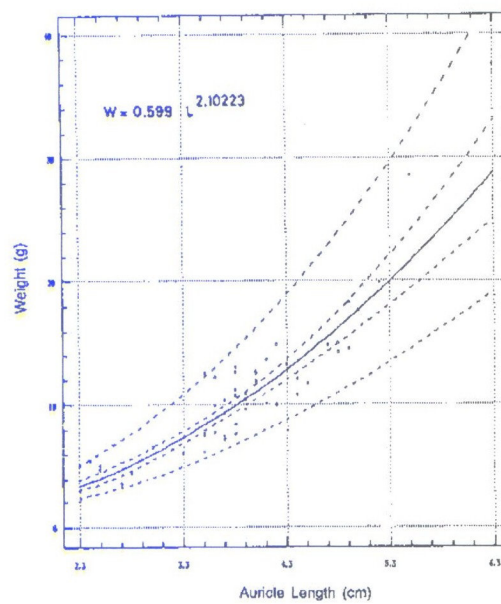


Figure 5. Regression of weight on auricle length. ----- Best fit : --- (Confidence limits % 99-%95)

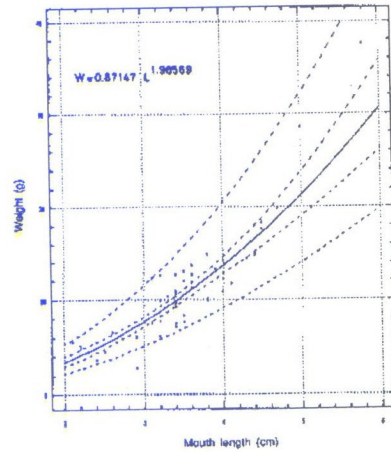


Figure 6. Regression of weight on mouth length. --- Best fit; --- (Confidence limits %99-%95).

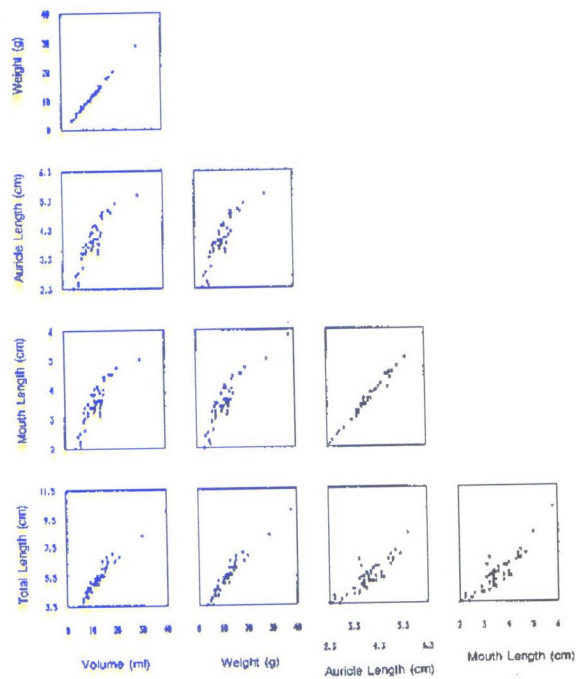


Figure 7. Matrix of existing relationship among biological parameters of *Mnemiopss leidyi*.

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wet weight (g) = 0.009 L^{1.872} (length in mm)
wet weight (g) = 0.01 L^{1.98} (length without lobes, mm).

The live weight (w) in mg of *Mnemiopsis* was determined from the size (mm) - weight equation $w = 2.36 L^{2.35}$ for the Black Sea (4). This equation may be erroneous because the equation found for the same species redefined as *Mnemiopsis maccradyi* inhabiting desalted regions of the Black Sea as $w = 0.001 L^{2.36}$ (9), and also yields twi as much values found for other regions. Biometric conversions for *Mnemiopsis leidyi* from Narragansett Bay also support this (8). The equations they derived are as follows:

Total weight - Total volume	$W = 0.981138 V - 0.944635$
Total weight - Total length	$W = 0.27762 L^{2.16839}$
Total weight - Auricle length	$W = 0.599 L^{2.10223}$
Total weight - Mouth length	$W = 0.87147 L^{1.98569}$