

FIRST RECORD OF *AMPHORELLOPSIS TETRAGONA* (PROTOZOA: CILIOPHORA: TINTINNINA) FROM THE SEA OF MARMARA

Benin Toklu-Alıçlı*¹, Neslihan Balkıs¹, Akın Savaş Toklu², Ahmet Höbek²

¹Istanbul University, Faculty of Science, Department of Biology, 34134 Vezneciler, Istanbul/TURKEY

²Istanbul University, Istanbul Faculty of Medicine, Department of Underwater and Hyperbaric Medicine, Istanbul/Turkey

Abstract

Amphorellopsis tetragona was reported for the first time from the Sea of Marmara and contributed to the regional check-list of the plankton species of Turkish seas. The specimen was collected on 17 October 2008 from surface neritic waters with a depth of 30m in the research area. The primary hydrographic parameters, temperature 17 °C, salinity 27 ppt and dissolved oxygen 5 mg l⁻¹, were recorded at the sampling station.

Keywords: First record, *Amphorellopsis tetragona*, Sea of Marmara.

***Corresponding author:** Benin Toklu Alıçlı (E-mail:benin@istanbul.edu.tr)

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Marmara Denizi'nden *Amphorellopsis tetragona* (Protozoa: Ciliophora: Tintinnina)'nın ilk kaydı

Özet

Amphorellopsis tetragona Marmara Denizi'nden ilk kez rapor edildi. Bu tür 17 Ekim 2008 tarihinde 30m derinlikteki araştırma bölgesinden neritik yüzey suyundan alındı. Örnekleme istasyonunda primer hidrografik parametrelerden sıcaklık 17 °C, tuzluluk 27 ppt ve çözülmüş oksijen 5 mg l⁻¹ olarak kaydedildi.

Anahtar kelimeler: İlk kayıt, *Amphorellopsis tetragona*, Marmara Denizi

Introduction

Tintinnids constitute one major component of marine planktonic ciliates and many species have an apparent cosmopolitan distribution in seas and oceans (Marshall, 1969). They are an important trophic intermediate in the planktonic food web because of their high productivity and their ability to feed on small, highly productive phytoplankton (Middlebrook et al., 1987). In addition, tintinnids are the best known group of marine ciliates and 90% of tintinnids are found in the upper water column.

The Sea of Marmara is a basin located between the continents of Europe and Asia. The basin is occupied by two distinctly different water masses throughout the year: the brackish

waters (22-26 ppt) of the Black Sea origin, forming a relatively thin surface layer (10-15m thick) with a mean residence time of about 4-5 month, and the subhalocline waters of Mediterranean origin (38.5-38.6 psu) separated from the former by a sharp interface (pycnocline) about 10-20 m thick (Ünlüata et al., 1990; Tuğrul & Polat, 1995). In particular, its surface waters are influenced by the less saline Black Sea waters, but in autumn and winter, winds cause the water to become rough, the stratification is broken up, and the more saline water from the bottom comes up to the surface (Balkıs, 2003). Such a phenomenon is important for the transport of tintinnids to the upper strata (Balkıs, 2004).

This paper reports the new record species *Amphorellopsis tetragona* (Jørgensen) Kofoid and Campbell, 1929 for the first time in the Sea of Marmara.

Material and methods

This study was carried out in the surface neritic waters of the coast of Kaşık Island in the Sea of Marmara (Figure 1).

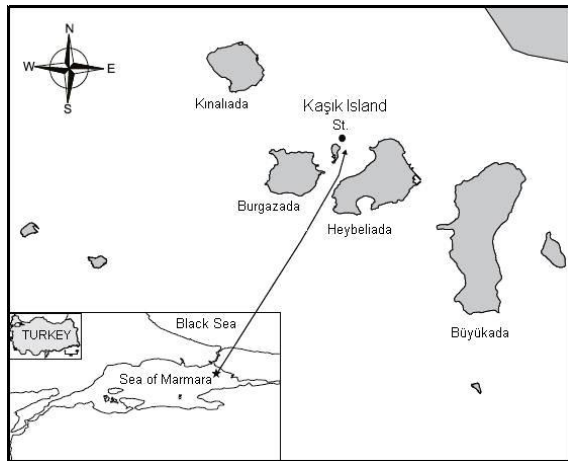


Figure 1: Research station in the Sea of Marmara.

Plankton samples were collected on 17 October 2008 from surface neritic waters with a depth of 30m. A 3 l water sampler with thermometer was used to collect samples and physical-chemical parameters. These samples were preserved in a 4% neutral formaldehyde solution. Observations were made through the use of an inverted phase contrast microscope equipped with a microphoto system at a magnification of 400X.

Results and discussion

Family: Tintinnidae Claus, 1876

Genus: *Amphorellopsis* Kofoid and Campbell, 1929

Amphorellopsis tetragona (Jørgensen) Kofoid and Campbell, 1929 (Figure 2)

Amphorellopsis tetragona, Kofoid and Campbell, 1929: fig. 604; Abboud-Abi Saab, 2008: 150, fig. 13.7.

Amphorella tetragona, Jørgensen, 1924: 19, fig. 15.

Only one specimen was observed. It has bowl shape with flaring mouth. Its shape narrow to aboral end. Longitudinal fin marked. Total length approximately 140 μm , oral dimension 35 μm .

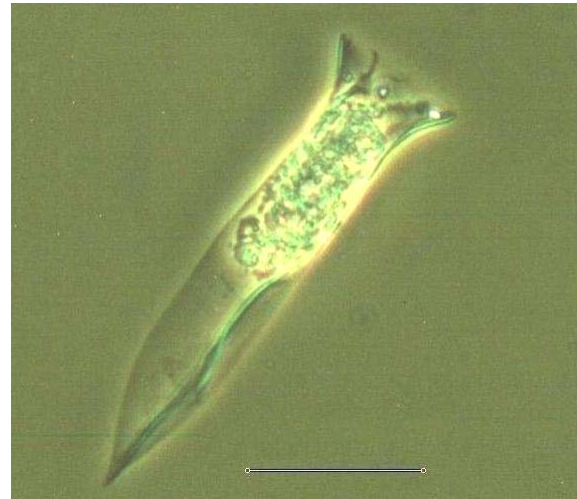


Figure 2: *Amphorellopsis tetragona* from the Sea of Marmara Scale bar: 50 μm .

For biogeographic studies, it is important to know where an organism lives. The genus *Amphorellopsis* shows a cosmopolitan distribution (Pierce and Turner, 1993). This species was also reported from the western Pacific Ocean, the southwest lagoon of New Caledonia, El-Mex Bay, Egypt and Bay of Bengal (Gomez, 2007; Dolan et al., 2006; Zakaria et al., 2007; Jyothibabu et al., 2008). Moreover, Abboud-Abi Saab (2008) found it in the surface waters of neritic and oceanic stations in central and North Lebanon.

This species was found at the surface water. A detailed study was carried out in the Sea of Marmara (Balkıs, 2004), but *A. tetragona* was not previously recorded from this area. The occurrence of this species for the first time in this study may be related to the lack of adequate studies in this region. This species may have

been transported to the area by current systems and balance waters may have caused the transportation of marine organisms from one site to another. Zakaria et al. (2007) reported that the highest abundance of this species was recorded from the waters between 10 and 30 ppt. In previous study (Balkıs, 2004), the tintinnid species were found in the range of 7.3-23.5 °C, 19.7-23.3 ppt and 7.13-11.95 mg l⁻¹. The hydrographical parameters at the sampling site in this study were 17 °C, 27 ppt and dissolved oxygen 5 mg l⁻¹. These values are characteristic for this area and the chemical oceanography of the Sea of Marmara is significantly influenced by the biochemistry of the Black Sea and the Aegean Sea (Ünlüata et al., 1990; Beşiktepe et al., 1995).

Consequently, *Amphorellopsis tetragona* has been reported for the first time from the Sea of Marmara and added to the regional check-list of the plankton species of Turkish seas with this study.

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References

- Abboud-Abi Saab, Marie. (2008) *Tintinnids of the Lebanese Coastal Waters (Eastern Mediterranean)*. CNRS-Lebanon.
- Balkıs, N. (2003) Seasonal variations in the phytoplankton and nutrient dynamics in the neritic water of Büyükçekmece Bay, Sea of Marmara. *Journal of Plankton Research*, 25, 703-717.
- Balkıs, N. (2004) Tintinnids (Protozoa: Ciliophora) of the Büyükçekmece Bay in the Sea of Marmara. *Scientia Marina*, 68, 33-44.
- Beşiktepe, Ş.T., Sur, H.I., Özsoy, E., Abdul Latif, M., Oğuz, T. and Ünlüata, Ü. (1995) The circulation and hydrography of the Marmara Sea. *Progress in Oceanography*, 34:285-334.
- Dolan, J.R., Jacquet, S. and Torrétón, J.P. (2006) Comparing taxonomic and morphological biodiversity of tintinnids (planktonic ciliates) of New Caledonia. *Limnology and Oceanography*, 51, 950-959.
- Gomez, F. (2007) Trends on the distribution of ciliates in the open Pacific Ocean. *Acta Oecologica*, 32, 188-202.
- Jørgensen, E. (1924) *Mediterranean Tintinnidae. Report of the Danish Oceanographical Expeditions 1908-1910 to the Mediterranean and adjacent seas*. Vol. II. Biology, No.8, J.3 (Thor Expedition). Copenhagen.
- Jyothibabu, R., Madhu, N.V., Maheswaran, P.A., Jayalakshmy, K. V., Nair, K. K. C. and Achuthankutty, C. T. (2008) Seasonal variation of microzooplankton (20-200 µm) and its possible implications on the vertical carbon flux in the western Bay of Bengal. *Continental Shelf Research*, 28(6), 737-755.
- Kofoed, C.A. and Campbell, A.S. (1929) *A conspectus of the marine and fresh-water ciliate belonging to the suborder Tintinnoinea, with descriptions of new species principally from the Agassiz expedition to the eastern tropical Pacific 1904-1905*. Vol. 34, University of California Publications in Zoology, Berkeley, California.
- Marshall, S.M. (1969) *Order: Tintinnida. Conseil international pour l'exploration de la mer*. Zooplankton sheet: 117-127.
- Middlebrook, K., Emerson, C. W., Roff, J.C. and Lynn, D.H. (1987) Distribution and abundance of tintinnids in the Quoddy Region of the Bay of Fundy. *Canadian Journal of Zoology*, 65, 594-601.
- Pierce, R. W. and Turner, J.T. (1993) Global biogeography of marine tintinnids. *Marine Ecology Progress Series*, 94, 11-26.
- Tuğrul, S. and Polat, S.C. (1995) Quantitative comparison of the influxes of nutrients and organic carbon into the Sea of Marmara both from anthropogenic sources and from the Black Sea. *Water Science Technology*, 32, 115-121.

Ünlüata, U., Oğuz, T., Latif, M.A. and Özsoy, E. (1990) On the physical oceanography of the Turkish Straits. In: Pratt L.J. (ed.), *The Physical Oceanography of Sea Straits*, Kluwer, Dordrecht, The Netherlands, pp.25-60

Zakaria, H.Y., Radwan, A.A. and Said, M.A. (2007) Influence of Salinity Variations on Zooplankton Community in El-Mex Bay, Alexandria, Egypt. *Egyptian Journal of Aquatic Research*, 33, 52-67.