

ABUNDANCE AND SIZE STRUCTURE OF *OIKOPLEURA DIOICA* SOUTH EASTERN

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Abstract

Oikopleura dioica is a unique species of Appendicularia living in the Black Sea. Seasonal size distribution of *O. dioica* in the southeastern Black Sea was studied between February and September, 2004. Total length of the specimens ranges between 0.15 mm and 2.85 mm, maximal size was observed in late spring.

Keywords : Black Sea, Plankton, Tunicata.

Introduction

Appendicularians are small pelagic and suspension feeders found in high numbers in the world ocean [1]. The only species living in the Black Sea is *Oikopleura dioica*, and being a filter feeding is extremely important in its food web [2]. *O. dioica* constructs a mucous shell but occasionally is observed "naked" [3]. It is an hermaphrodite, and its well developed ovary occupies the entire apical region of the body [4]. The grazing rate of *O. dioica* in the field can equal or surpass those of copepods [2]. The present study shows that body size is one of the most important factors affecting the clearance rate of *O. dioica* [1]. The aim of this study was to investigate seasonal size structure of *O. dioica* in southeast Black Sea.

Materials and Methods

Plankton samples were taken by R/V KTU DENAR during February-September 2004 off Trabzon, on the southeastern coast of the Black Sea, using Hensen type closing net with 75 μ m mesh size, 70 cm mount diameter, and 220 cm long net. The plankton nets were towed vertically from 150 m depth to surface. The volumes of the sea water filtered were calculated by digital flowmeter (Hydro-bios Kiel, No 439115). The samples were preserved in borate-buffered 4% formaldehyde-seawater solution until laboratory analysis [5]. *O. dioica* were removed from the solution and counted Total body length (μ m), tail length (μ m), trunk length (μ m), and trunk height (μ m), were measured under the stereomicroscope. Population structure of *O. dioica* was compared by one-way ANOVA. When significant differences were found ($p < 0.05$) comparison among means were made with a Tukey test [6].

Result and discussion

Seasonal anomalies were not observed in sea water temperature: minimum and maximum temperature were 9.3 °C (February) and 26.7 °C (August), respectively. Relationship between tail length- total length, total length-trunk length and trunk length- trunk height are shown in figure 1A, figure 1B and figure 1C, respectively. Linear positive relationship was observed between tail length and total lengths. Total length (included tail) of the *O. dioica* ranges between 0.15 mm and 2.85 mm. Small size organisms were observed in February, when average mean length of *O. dioica* was 0.25 ± 0.11 mm. Mean total length was high at April (1.85 ± 0.57 mm). 11 April 2004 sampling period was statistically different than others months. Although 98% of the *O. dioica* size ranged between 0.2 and 0.8 mm and maximum length (exclude tail) of the organism was 1 mm in the North Black Sea [2], in the present study 99% of the organism size ranged between 0.1 and 0.7 mm and max length was 0.76 mm.

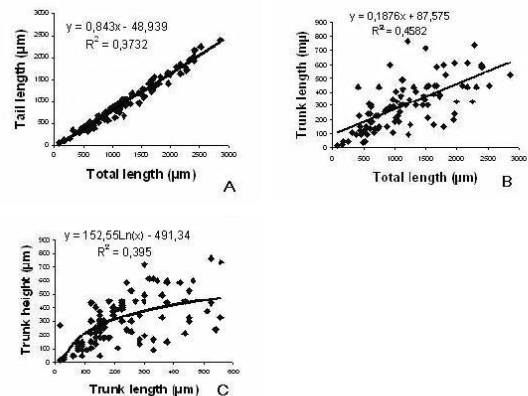


Fig. 1. Figure 1 A. Relationship between tail length and total length; B. Relationship between total length and trunk length; C Relationship between trunk length and trunk height;

References

- 1 - Broms, F. and Tiselius, P., 2003. Effect of temperature and body size on the clearance rate of *Oikopleura dioica*. *Journal of Plankton Research*, 25(5): 573-577.
- 2 - Shiganova, T., 2005. Changes in appendicularian *Oikopleura dioica* abundance caused by invasion of alien ctenophores in Black Sea. *J. Mar. Bio. Ass. U.K.*, 85, 477-494.
- 3 - Larink, O. and Westheid, W., 2006. Coastal Plankton. Verlag Dr.Friedrich Pfeil, München, 143 p
- 4 - Todd, C.D. and Laverack, M.S., 1991. Coastal Marine Zooplankton, Cambridge University Press, Great Britain, 106 p.
- 5 - Harris, R.P., Wiebe P.H., Lenz, J., Skjoldal, H.J. and Huntley, M. 2000. Zooplankton Methodology Manual, Academic Press, UK 684 p.
- 6 - Zar, J. H., 1999, Biostatistician Analysis, Prentice Hall International, USA .663 p