

INTERANNUAL AND SEASONAL VARIATIONS OF COASTAL MESOZOOPLANKTON ABUNDANCE AND BIOMASS IN ISKENDERUN BAY

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Abstract

Mesozooplankton was studied during the period between 2008 and 2012 in coastal waters of the Iskenderun Bay in order to characterize temporal distribution of mesozooplankton and their relationship with some environmental factors. Interannual and seasonal fluctuations in abundance and biomass of mesozooplankton were observed in coastal waters of Iskenderun bay. Mesozooplankton peaks were found mainly in spring, summer and autumn, but these peak times were changed among the years. Mesozooplankton was well correlated with all measured environmental variables at 0.01 significant levels. As a result, trophic elements and abiotic factors of study area seems to be effected mesozooplankton standing stock

Keywords: Coastal waters, Zooplankton, Biomass, Iskenderun Bay

Introduction

The coast of marine environment areas are sensitive and variable because of being affected from both variations in terrestrial input and open sea waters. Living organisms, such as zooplankton, are mostly affected these variability. There are several zooplankton studies concerning the distribution of zooplankton groups, abundance and biomass in southern coastal area of the Turkey [1, 2]. However, there aren't any information about interannual variation of mesozooplankton. The aim of this study is to increase our knowledge about seasonal and interannual distribution of zooplankton biomass and abundance as well as impact of some environmental parameters on zooplankton distribution.

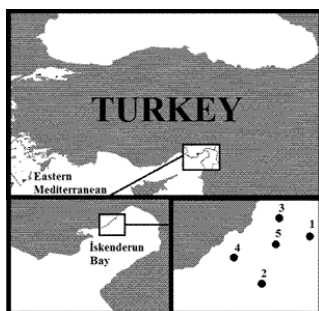


Fig. 1. Study area

Material and Methods

Iskenderun Bay is located in the Eastern Mediterranean. The Bay is approximately 65 km long and 35 km wide, giving surface water body area of a 2275 km (Figure 1). It is a shallow coastal area averaging 100 m maximum depth. Samplings were performed at five stations in the western coastal waters of Iskenderun Bay between 2008 and 2012. Zooplankton was sampled vertically during April, July, October and December of each year. Two samples was towed using WP-2 net (200 µm) at each station for abundance and biomass measurements. Biomass was measured as dry weight and determined according to [3]. Temperature and salinity were measured using YSI 650 CTD probe at the surface and depths of 5m., 10 m. and 15 m. Chlorophyll-a and phytoplankton abundance were obtained from water samples taken simultaneously at the same depths using a Niskin water sampler. The spearman rank correlation was applied to estimate relationship between environmental factors and mesozooplankton amount by using SPSS V17 software.

Results and Discussion

Interannual and seasonal fluctuations in mesozooplankton abundance and biomass were observed in the study area (Figure 2). Mesozooplankton abundance varied from 582 ind m⁻³ (spring, 2012) to 10892 ind m⁻³ (spring, 2011), while biomass varied between 2.7 mg m⁻³ (spring, 2012) and 31.38 mg m⁻³ (autumn, 2008). Mesozooplankton peaks were observed mainly in spring, summer and autumn, but these peak times were changed in the years. Spring and autumn mesozooplankton peaks were observed in first two years, whereas

spring and summer peaks were observed following two years. In last year, summer and autumn peaks were found. The present study provided results on seasonal variation of zooplankton abundance, biomass and size structure within five-year period in Iskenderun Bay, about which we had limited information. Although five-year study is inadequate to explain interannual variations of zooplankton, it can help to determine the effect of environmental factors varied among years on zooplankton. Mesozooplankton was well correlated with all measured environmental variables at 0.01 significant level. Positive correlation was observed phytoplankton abundance with both biomass and abundance of mesozooplankton. Mesozooplankton abundance was positively correlated with temperature and negatively correlated with salinity, while positive correlation was found between mesozooplankton biomass and chlorophyll-a. As a conclusion, it seems that the trophic elements and abiotic conditions was the main factor affecting the mesozooplankton standing stock. Additionally, predation and competition by planktivorous fishes could be effected structuring the zooplankton community [4]. However, since the effect of fish predation was not studied in this study, it would be inconvenient to comment on the subject.

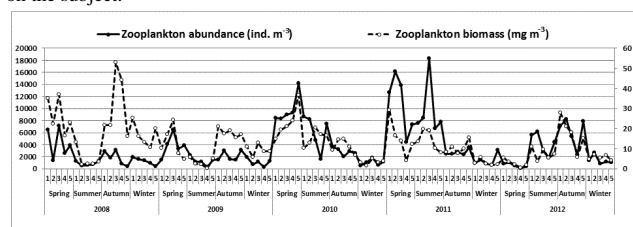


Fig. 2. Interannual and seasonal variations of mesozooplankton in coastal waters of Iskenderun bay

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