EPIPELAGIC MESOZOOPLANKTON AND COPEPOD GRAZING ALONG AN EAST-WEST TRANSECT IN THE MEDITERRANEAN SEA

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Abstract
An increasing east-west trend of mesozooplankton biomass and abundance was detected in the Mediterranean Sea during June 1999. However, species composition did not show any significant differences. Samples collected from cyclonic gyres were distinguished for their increased biomass, abundance and grazing impact on autotrophic production.

Key-words: mesozooplankton, grazing, Mediterranean

Introduction

A eastwards gradient of increasing oligotrophy is well established in the Mediterranean Sea (1). Mesozooplankton abundance, biomass, species composition and copepod grazing on autotrophs were studied in the epipelagial during trans- Mediterranean cruise (EU-project MATER).

Methods

Mesozooplankton samples were collected during June 1999 at 9 stations along an east-west transect in the epipelagial (to depth of 100m) by a WP-2 net (200μm). Samples were collected at midday and midnight for the estimation of copepod grazing. The gut fluorescence of two size fractions (<500μm and >500μm) of copepods was measured and ingestion rates were estimated (2).

Results and discussion

Total zooplankton abundance values increased from east (M1=93 ind m^{-3}) to west (M9=898 ind m^{-3}, Figure 1). Biomass values (dry weight) presented the same trend, varying from 1.09 mg m^{-3} (M1) to 4.16 mg m^{-3} (M9). Samples collected within the Cretan (M4) and Rhodos (M2) cyclonic gyres were characterized by high mesozooplankton abundance and biomass compared with other samples in the eastern Mediterranean Sea; increased abundance values were observed during previous studies in the Rhodos gyre (3, 4). Copepods were the dominant group, representing 56% (M8) to 91% (M9) of the zooplanktonic community. *Clausocalanus* copepodites, *Farranula rostrata*, *Oithona* copepodites, *Oncaea media*, *Oithona plumifera*, *Mecynocera clausi*, *Calocalanus* spp., *Corycaeus* spp., *Oithona setigera* were the most abundant taxa over all stations. Some species exhibited differentiated distribution patterns: *F. rostrata* and *Corycaeus* spp. presented an east-west decreasing trend; *Oithona* copepodites, *O. setigera* and *M. clausi* were more abundant in the central part. *Clausocalanus pergens* dominated station M9, a fact probably related to the lower temperature compared to the eastern basin (Theocharis, pers.comm.). Similar zooplankton abundance and species composition were found in the Ionian Sea in April-May 1999 by Mazzocchi *et al.* (5) The abundance of appendicularians and of *Oncaea* spp was significant at stations M2 and M4, suggesting feeding relationships among these taxa (5). Station M8 was characterized by the significant presence of chaetognaths, siphonophors and the low relative abundance of copepods, implying a grazing control by the former taxa. The copepods' gut pigment concentrations varied between 0.042 ng chl-α cop^{-1} (<500 μm at M7-day) and 1.39 ng chl-α cop^{-1} (>500 μm at M8-night). Ingestion rates were calculated to be 1.8-35.9 ng chl-α cop^{-1} d^{-1}.

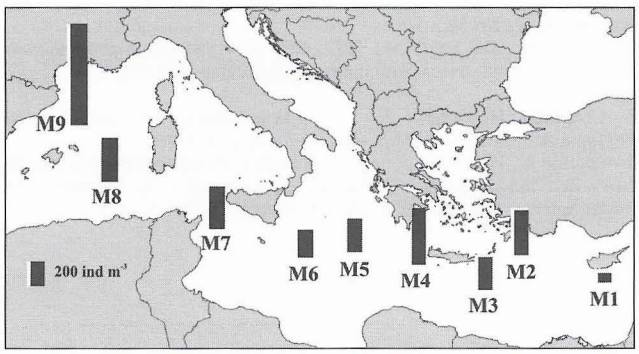

Fig. 1. Mesozooplankton abundance distribution in the 0-100 m layer during June 1999.

Although primary production values (measured during the same cruise) have revealed an increasing east-west trend (O. Gotsis-Skretas and K. Pagou, pers.comm.), the potential grazing pressure of copepods over the >1.2 μm fraction of primary production did not reveal any clear trend. The estimated consumed portion of the autotrophic production was very low at stations M6 and M7 (less than 10%) and high at station M4 (35%). This strong grazing impact is related both to high ingestion rates and to high copepod abundance relatively to the available primary production. It is worth noting that the abundance of ciliates at stations M2 and M4 was lower than that of the neighbouring stations (6) probably due to a top-down control by copepods.

Our results confirm that the mesozooplankton abundance and biomass differ among the basins of the Meditterranean Sea. The hydrological features seem to play an important role for the pelagic food web within the very oligotrophic eastern basin.

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