

IMPORTANCE OF THE COPEPODITE STAGES IN THE TOTAL NUMBER OF CALANOID COPEPODS IN THE MIDDLE ADRIATIC SEA

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Abstract

Samples were collected at six stations along Palagruža transect in the Middle Adriatic Sea during four cruises in 2002 and five in 2003. Contribution of juvenile developmental stages of calanoids was pointed out. Their percentages in the total number of calanoids were 41-92%. The highest values were in April, on the station CJ007 from maximal 1333 ind./m³, 1117 ind./m³ copepodites.

Keywords : *Adriatic Sea, Copepoda, Zooplankton.*

Introduction

The duration of life cycle from egg to adult in calanoid copepods is governed primarily by temperature and food availability. In the past investigations of the calanoid copepods of Adriatic Sea, copepodite stages were insufficiently represented. Because of the method of sampling, big mesh size nets (>200 µm) were used, majority of calanoid developmental stages flew through. Many authors counted them with corresponding species.

Materials and methods

Planktonic material was investigated along Palagruža transect in the Middle Adriatic Sea during four cruises in 2002 (May, June, August and September) and five in 2003 (April, June, August, October and December). Samples were collected at six stations (CJ007-CJ012) using Nansen net with mesh size 200 µm, mouth opening 57 cm and length 255 cm in one or two vertical hauls depending on stations' depth. Organisms were preserved in 2.5% formaldehyde neutralized with CaCO₃ and later in the laboratory, counted by the means of stereomicroscope Carl Zeiss. All results are presented as the number of individuals per cubic meter (ind./m³). Differentiating the last copepodite stage from adults is rather difficult in some groups so they are often counted in adults.

Results and discussion

Papers in which the authors refer to copepodite developmental stages as a special quantitative and qualitative category are very scarce. Hure and Scotto di Carlo (1969) investigated open waters of northern Adriatic with 333 µm mesh size net (No.3). According to authors, winter samples include minimum copepodites and their number grows up to 40.2% in the total number at the end of the year. Although they noticed quantitative importance they couldn't tell about their real representation in the calanoid populations.

In this investigation contribution of postnaupliar developmental stages in the total number of individuals of calanoids was 41-92% with a median value of 81%. Examining each cruise, percentage of the copepodites ranged from 72 to 85%, except in September 2002 (48%) when the adults prevailed. Some of the calanoid families (e.g. Calanidae, Centropagidae, and Augaptilidae) recorded maximal number of copepodites in late spring and summer, but most of the others were equally presented and dominated during all cruises. Figure 1. shows abundance of the adult and copepodite stages of calanoid copepods in biannual cycle. Although the copepodite values are five times higher than the adult ones, their cycles are nearly equal with the same exception of September 2002.

Lučić i Kršinić (1998) investigated zooplankton in Mali Ston Bay with the Adriatic net equipped with different mesh gauze cylinders, 125 and 250 µm. Statistically significant difference (p<0.001) in calanoid copepodite abundance was determined. 250 µm mesh sized net kept only 27.7% calanoids i.e. 2.2-8.4% of their copepodite stages comparing to 125 µm mesh sized net.

Pronouncedly high concentrations of copepodite stages in the total number of calanoid copepods verify their quantitative importance not only in the Middle Adriatic, but also in general. It would be advisable to perform detailed investigations of the Adriatic Sea and to apply appropriate sampling methods in order to obtain the complete picture about populations of calanoid copepods, their adult individuals but also their copepodites.

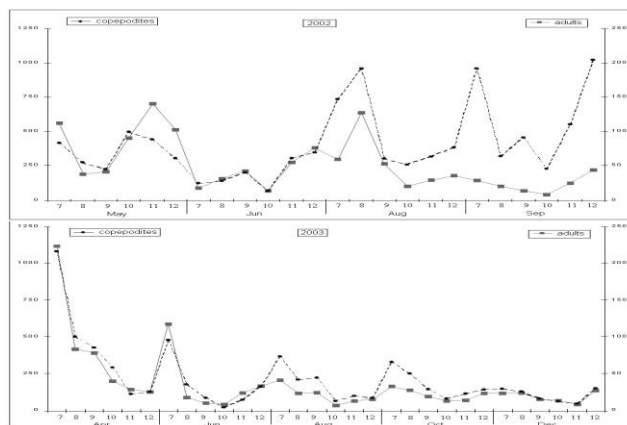


Fig. 1. Abundance of the adult and copepodite stages of calanoid copepods in biannual cycle.

References

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