Long term observation of Phyto and Zooplankton in the open middle Adriatic (1961-1981)

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The results of analyses of multiannual density (1961-1981) of some herbivore zooplankton groups (Copepoda, Appendicularia, Cladocera and Thaliacea) in relation to density changes of phytoplankton at the station Stoncica in the open middle Adriatic are presented.

Introduction

Earlier studies report that high zooplankton concentrations were found in different seas as well as in the Adriatic waters simultaneously with low phytoplankton concentrations and *vice versa* very dense phytoplankton populations in the areas with very poor presence of zooplankton. The goal of this paper was to establish the relationship between prevalently herbivore zooplankton groups and phytoplankton density over a long term interval.

Materials and methods

Phytoplankton samples were collected by Nansen bottles at 0, 10, 20, 30, 50, 75 and 100 m depths. Density is expressed as the number of cells per liter referring to the mean value for all sampled depths. Zooplankton material was collected by vertical Hensen net hauls from the bottom to surface (100-0 m). Density is expressed as the number of individuals per cubic metre.

Results and discussion

Studies of long term fluctuations (1961-1981) of the total phytoplankton at the station Stoncica in the middle Adriatic, show a constant trend of phytoplankton density increase as well as that of primary production (PUCHER-PETKOVIC *et al.*, 1988) for the past few years. We attempt to establish the way individual zooplankton groups respond to phytoplankton density changes. We found that the trend of increase in the numbers of Thaliacea and Cladocera groups coincided broadly with the long term increase in phytoplankton density. A year lag was recorded in Thaliacea in relation to phytoplankton density increase (Figure 1a). Relatively poorer increase in numbers of Copepoda group coincided in time with intensive phytoplankton growth (Figure 1b). Long term phytoplankton fluctuations did not coincide in time with the changes in Appendicularia numbers even though some earlier studies reported that this zooplankton group most readily responded to an increase in primary production (VUCETIC & PUCHER-PETKOVIC, 1969).

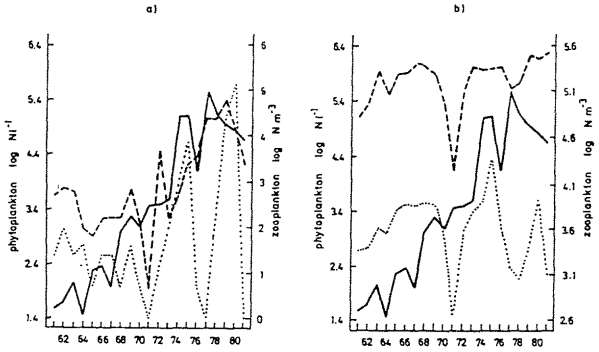

Fig. 1 Multiannual fluctuations in **a)** Cladocera (----) and Thaliacea (....)
b) Copepoda (----) and Appendicularia (.....) density in relation to phytoplankton fluctuations (——) (Stoncica, annual means 1961-1981).

Conclusions

A comparative analysis of multiannual variations of phyto and zooplankton in this area shows that an increase in phytoplankton density results in an increase in the number of Cladocera and Thaliacea. In Thaliacea a year lag in density increase was observed. The increase trend was slightly poorer in Copepoda whereas no increase trend was observed in Appendicularia.

REFERENCES

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