

THE RELATIVE IMPORTANCE OF PROTOZOANS
IN A BALTIC ESTUARINE ZOOPLANKTON COMMUNITY

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ABSTRACT

The proto- and metazooplankton at a station in the shallow eutrophic Darss-Zingst estuary (southern Baltic, S: 3-7 ‰) was investigated for two years using live counts (droplet method) for protozoans and counts of sedimented fixed samples for metazooplankton. Protozoans significantly dominate the community numerically and account for most of the zooplankton biomass for the whole year, except for early summer, when copepods reach their maximum abundances and protozoans account for less than 30 %. Even though these are preliminary results they suggest that protozooplankton makes a very significant contribution to the matter flux of this eutrophic estuary.

INTRODUCTION

The knowledge of the importance of planktonic protozoans in natural aquatic ecosystems has increased, especially during the last decade, in marine (e.g. Bøers 1982) as well as in limnetic waters (e.g. Pace & Orcutt 1981). But until recently, only a few studies have been published on the role of protozooplankton in estuaries, even in the well investigated areas of the Baltic with respect to other biological components (e.g. Schwarz 1961, Biernacka 1963, Elbrächter 1970, Boikova 1984).

The ecosystem comprising the inner coastal waters south of the Darss-Zingst peninsula served as an object of modelling efforts for several years (cf. Vietinghoff 1984). Most functional groups have already been investigated, incl. benthic ciliates (cf. Scharf & Schnese 1984), but there is a lack for studies on protozooplankton.

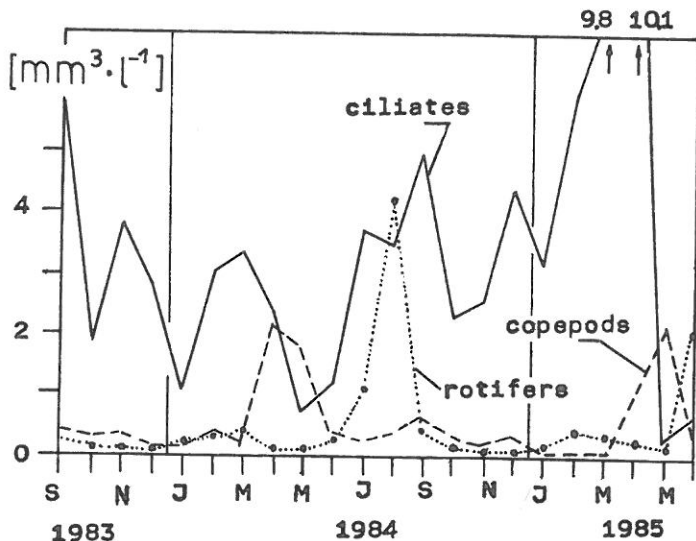


Fig. 1 Seasonal changes in biomasses of planktonic ciliates, copepods, and rotifers at station "Zingster Strom" in 1983-1985.

values of bacterial production (cf. Jost & Ballin 1984). During summer the dominating rotifer species which are known to be microconsumers (cf. Vietinghoff et al. 1984, Arndt et al. 1984), could be effective competitors of the ciliates. The sharp decrease in protozoan biomass in May is related to a very high biomass of the calanoid copepod *Eurytemora affinis*. Our own feeding experiments (^{14}C -method, unpubl.) and results by Berk et al. (1977) indicated that this copepod could be an effective consumer of ciliates. So for the interpretation of the late spring minimum of protozoans, in addition to qualitative changes in the protozoan community, predation could be discussed as a possible cause. For studies of causal relationships within the plankton community detailed qualitative studies are planned.

Fig. 2 indicates that ciliates are the dominant part of zooplankton biomass throughout the year, except for the period May-June. The annual mean biomass values of ciliates, rotifers, and copepods for 1984 were 2.70, 0.60, and 0.61 $\text{g fw} \cdot \text{m}^{-3}$, respectively (other zooplankton groups were

ary the short food chain, including phytoplankton, bacteria and protozooplankton, seems to be of major importance. The established high relative importance of protozoans confirm previous studies in marine (e.g. Beers 1982, Stegmann & Peinert 1984) and limnetic waters (Pace & Orcutt 1981).

Though these are only preliminary results, the overall significance of protozoans within the plankton community of the Darss-Zingst estuary underlines the necessity of protozoological research in ecological studies of estuaries.

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