

# BIOGEOGRAPHICAL STRUCTURE OF ZOOPLANKTON COMMUNITY ALONG THE NORTHWESTERN COAST OF EGYPT

Nehad M. Nour El-Din

Oceanography Department, Faculty of Science, Alexandria University, Egypt - nmnoureddin@yahoo.com

## Abstract

The biogeographical structure of zooplankton assemblages was studied for the NW coast of Egypt. Vertical and horizontal hauls were collected from 4 sectors during 2002. The zooplankton population appears both qualitatively and quantitatively quite heterogeneous. Copepods represent the most important group followed by Chaetognaths, Cladocera, Appendicularians and larval stages of Gastropods. The specific diversity of the zooplankton community is generally quite high. About 30 to 39 species per station have been counted, with a total of about 96 species identified over the whole survey. The exposure of the area to different types of pollutants, the hydrography of the area as well as food availability are the main factors affecting the geographical distribution and abundance of zooplankton community.

*Keywords: Zooplankton distribution, diversity, environmental stress, Egyptian coast*

## Introduction

The NW coast of Egypt extends from west of Alexandria to the Libyan borders. The coast is a fragile environment receiving less amount of discharge from Land-based activities when compared to the Nile delta and Alexandria coastal waters. However, the development along the NW coast and its exposure to pollution discharge, especially from oil tankers, renders the area to fall continuously under environmental stress.

Environmental factors play a major role in the distribution pattern of zooplankton and species composition in the marine system. Their abundance are not only associated with changes in food supply but also with combined effect exerted by hydrographic conditions and pollution stress. In view of the increasing exposure of the NW coast of Egypt to man-made activities, the present survey aimed to investigate the impact of such activities on the numerical abundance, distribution pattern and diversity of the zooplankton community.

## Results and discussion

Along the NW coast of Egypt, zooplankton samples were collected from four sectors namely from east to west: Agami, Krir, W. Dabaa and Matrouh, extending west of Alexandria city, using an 0.5 m mouth diameter and 120 µm net. Samples locations were chosen in inshore/offshore sectors opposite to main man-made-activities as well as oil related activities in the area.

The zooplankton population is quantitatively very heterogenous varying between 35 and 2940 individuals/m<sup>3</sup>. The population density increased towards the eastern inshore sectors presenting an absolute and relative maximum density for certain number of species such as: *Centropages kroyeri*, an epiplanktonic hot tempered area copepod, frequent in the region; *Evadne spinifera* (Cladocera) thermophilic, very frequent in the eastern part of the Mediterranean Sea and *Sagitta friderici* (Chaetognatha) also an indicator of the Atlantic Ocean waters. The oceanic influence at the offshore stations is confirmed by the appearance of some Tunicata and especially Appendicularia belonging to the *Oikopleura* genus. *Tretomphallus bulloides* (Foraminifera) formed 65% of the zooplankton population at areas rich with *Poseдонia oceanica* leaves. The poverty of holoplanktonic forms off Krir (subjected to deliberate disposal of ballast water) is probably related to the abundance of plastic rubbish and hydrocarbon pellets collected concurrently at this sector.

Copepods dominated the zooplankton community constituting more than 70% in most stations. The main copepod group was Calanoidae represented by the neritic species: *Clausocalanus furcatus*, *Labidocera brunescens*, *Paracalanus parvus*, *Centropages kroyeri*, *Acartia josephina*, which reached its maximum number at the inshore stations of the most eastern sector, indicated the exposure of the area to organic pollution.

Despite the exposure to land-based discharge, the zooplankton community of the eastern sectors is more richer and diversified. These sectors were dominated by *Clausocalanus furcatus*. High values of Shannon Diversity Index (3-3.5) indicate great structuring and maturity of the population.

The extreme poverty of the phytoplanktonic population is the most characteristic feature of the area (range 230 to 22,605 cells/liter).

Chlorophyll *a* values were normally < 1 µg/L, especially for the western sectors. While food availability seems to control zooplankton abundance along the western sectors, the distribution of zooplankton community is more controlled with the discharge from Land-based activities.