

DYNAMICS AND BIOMASS OF ZOOPLANKTON IN THE NORTH LAGOON OF TUNIS (SOUTH WESTERN MEDITERRANEAN LAGOON)

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Abstract

The aim of this study is to show the sensibility of zooplankton community to abiotic conditions and its inter-annual variations in coastal marine ecosystems such as the north lagoon of Tunis.

Key words: Zooplankton, copepods, dry weight

Introduction

The north lagoon of Tunis (2600 ha) is a shallow (average depth 1.5 m) restored lagoon located in the south western Mediterranean Sea. It communicates with the bay of Tunis by Kherreddine canal and its hydrodynamic conditions are influenced by atmospheric and tidal rhythms. This study is a part of a monitoring program concerning physico-chemical parameters and plankton communities, especially copepod diversity and dynamics, showing the importance of inter-annual variability. The abundance and biomass of zooplankton and environmental factors are compared between summer 2001 and 2002.

Material and methods

A weekly sampling strategy was undertaken during summer 2001 and 2002 in the monitoring routine station (Fig. 1). All zooplankton and physico-chemical analyses were done by standard methods described in literature.

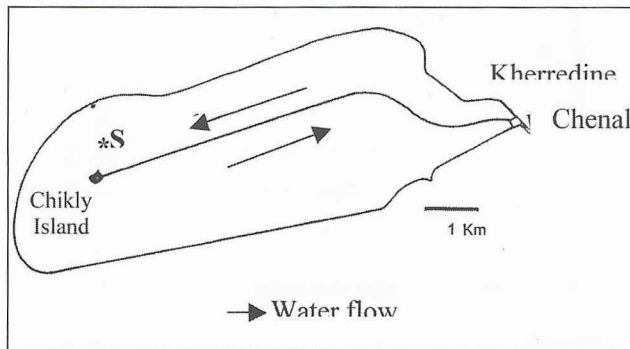


Fig. 1. The sampling station (s) in the north lagoon of Tunis.

Results and discussion

Surface water salinity, temperature, nitrites and phosphates values reveal a slight decrease between the two periods of study. However, an important increase in ammonia and nitrates concentrations was noticed (Table 1).

The zooplankton was dominated by copepods, appendicularians and medusae. The comparison between the two periods indicated a drastic decrease of total zooplankton from 10335 ind/m³ to 2076 ind/m³ partially explained by the phytoplankton biomass depletion (from 0.7µg/l to 0.4 µg/l chlorophyll a) and the abundance of macrozooplankton competitors (Schyphomedusae) in the second study period. However, in term of biomass, estimated as dry weight (1), a very little decrease was observed. In fact, the average values reached respectively 1512µg/m³ and 1454 mg/m³ in summer 2001 and 2002 (Fig. 2).

Table 1. Average summer values of physico-chemicals. Parameters in the north lagoon of Tunis.

Parameters	T (°C)	S (psu)	N-NH4 (µg/l)	N-NO3 (µg/l)	N-NO2 (µg/l)	P-PO4 (µg/l)
Summer 2001	27.1	40.4	280.6	43.4	5.2	15.5
Summer 2002	26.3	39	509	72	3.8	12.7

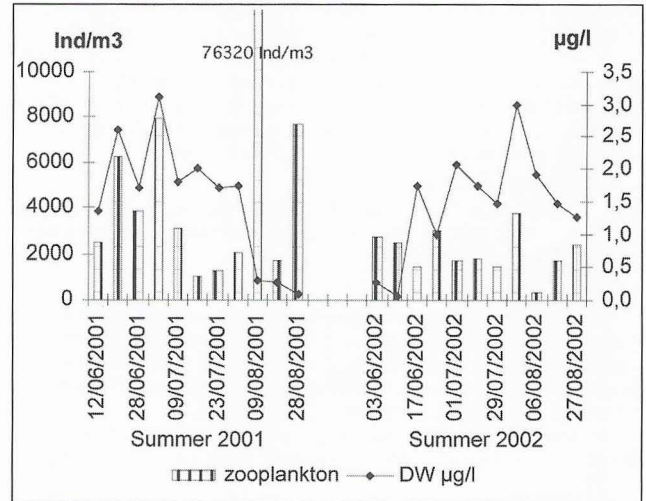


Fig. 2. Summer zooplankton and dry weight. Variations in the north lagoon of Tunis.

During these two seasons total zooplankton was dominated by copepod nauplii (91.52 % in summer 2001; 47, 90 in summer 2002) confirming the nursery role of the lagoon (2). Copepodites and adult copepods represented respectively 3% and 15.36% in summers 2001 and 2002.

The composition of dominant copepod species was also different in the two years. During summer 2001, the copepod community was dominated in order of rank by *Labidocera brunescens* (28.6%), *Centropages kroyeri* (12%), *Acartia clausi* (12%) and *Euterpina acutifrons* (10%). Whereas, in summer 2002, the dominant copepods were *Centropages kroyeri* (20%) *Oithona nana* (19%), *Acartia discaudata*(16%), *Acartia clausi*(10%) and *Euterpina acutifrons* (10%).

This study reveals that the north lagoon of Tunis can be considered as a mesocosm where herbivorous planktonic populations are in competition for the limited phytoplankton stock. We hypothesize that the microbial loop must play an important role in this ecosystem.

Références

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