BIODIVERSITY OF THE MARINE PLANKTON IN LEBANESE WATERS AND LEVANTINE BASIN (EASTERN MEDITERRANEAN)

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Abstract

Planktonic fauna and flora of the Levantine basin is a Mediterranean temperate type with certain subtropical affinity. Studies carried out since 1965 showed a high taxonomic diversity in comparison with other regions of the Eastern Mediterranean. To date, 400 taxa of phytoplankton have been recorded, including 151 diatoms belonging to 46 genera, 227 dinoflagellates with 33 genera, 5 silicoflagellates and 2 ebriidae. Zooplankton subcommunity comprises all the known Mediterranean groups; with 200 microzooplankton species and 600 mesozooplankton, including 171 species of copepods. Several species are of Indo-Pacific origin and considered as "Lessepsian". The spatio-temporal distribution and the abundance of the species are affected by hydrographic conditions, namely temperature, salinity, nutrient concentration, phytoplankton standing crop and current regime. The oligotrophy of the Levantine basin affects the primary production and the plankton biomass .

Keywords : Plankton., Biodiversity, Lebanon, Levantine Basin

Introduction

The Levantine Basin and the Red Sea are both characterized by a heavy oligotrophy, a high temperature, and saliniy. However the plankton of the Levantine Basin belong to Mediterranean temperate fauna and flora, with certain subtropical affinity. 69% of planktonic taxa inhabiting the Eastern Mediterranean are present in the Western basin and only 33% are common with the plankton of Red Sea (1, 2). The opening of the Suez Canal in 1869 to navigation, has accelerated the migration phenomenon allowing colonization of the Eastern Mediterranean by many Indo-Pacific elements (3, 4). The plankton of the Lebanese water is unknown untill the seventies (5). Phytoplankton data and primary production study made in Lebanese waters confirm the oligotrophy characterizing the Levantine Basin (6,7). However this poverty of the plankton contrasts with a high taxonomic diversity. Four hundred phytoplankton species were identified from the inshore and offshore Lebanese waters (8). Zooplankton community displays a low in biomass, and a high species diversity (9). In a recent study on the biodiversity of marine flora and fauna of Lebanon (10), we focused on the endangered taxa and menaced species. In the present paper, we give a general aspect of the biodiversity of the plankton community from the Lebanese water.

Material and methods

Qualitative and quantitative surface and vertical samples of both phytoplankton and zooplankton were collected since 1968 from inshore and offshore waters along the coast of Lebanon :33°52'N-35°29'E and 34°30'N-35°5'E Hydrological parameters including T° C, S‰, O_2, Chl.*a*, PO_4,NO_3 and Secchi were accompainying plankton sampling. Identification of taxa was made up to species

Results

The majority of the species occurring in the Eastern Mediterranean are present in the Western basin. However some differences in the abundance and distribution are recorded between the two areas. Several Indo-Pacific species that were introduced through the Suex Canal ,are confined only to the Levantine Basin..41% of the Diatoms present in the East Mediterranean are also present in the Red Sea and 54% of the dinoflagellates are common for the two basins (1,2). Diatoms constitute 75% of the total standing crop and 40% of the total phytoplankton species, while Dinoflagellates, although more diversified constitute only 15-20% of the abundance .The total number of taxa is given in Table 1.

Table1- Taxonomic distribution of phytoplankton community from Lebanese waters

Groups	Nb. Families	Nb. Genera	Nb. Species
Bacillariophyceae (Diatoms)	15	46	151
Dinoflagellata	14	33	227
Silicoflagellata	3	3	5
Ebriidae	2	2	2

The phytoplankton bloom, is recorded always in spring (April-May).This maximum of standing crop corresponds with a low species diversity; while the highest diversity is computed in January-February when the density is low. During the long and hot period summer, the phytoplankton is poor standing crop is the lowest; the dinoflagellates are more important than diatoms. 18 potentially toxic species are reported in coastal and estuarine waters : including 7 diatoms and 11 dinoflagellates (11).

Zooplankton is highly diversified ; all zoological groups are represented from the microzooplankton up to the prochordates. The most important groups are represented. In addition to the microzoplankton we have : *Cnidaria, Ctenaria, Polychaeta, Crustacea, Chaetognatha, Mollusca, Apendicularia, Tunicata, Meroplankton larvae*; *Eggs* and *Fish larva*e. The number of species so far recorded in the Lebanese waters amounts to 790 species, including 242 protozoans(10) Total number of taxa is given in Table 2.

Table 2- Distribution of zooplankton groups from Lebanese seawater.

Groups	Nb.Species	Groups	Nb Species
Foraminifera	12	*Mysidaceae*	4
Actinopoda	66	*Cirripedia larvae*	4
Tintinniidae	121	*Décapoda larvae*	106
Hydromedusa	68	*Chaetognatha*	10
Scyphozoa	5	*Pteropoda*	9
Siphonophora	28	*Heteropoda*	4
Copepoda	173	*Polychaeta* (larvae)	8
Cladocera	6	*Polychaeta* (adults)	4
Ostracoda	6	*Appendicularia*	15
Amphipoda	25	*Thaliacea*	6
Euphausiaceae	5	*Eggs & Fish larvae*	84

Out of the 68 species of **Hydromedusae** reported from Lebanese waters (12),11 are considered as tropical forms of Indo-Pacific origin. Among the **Scyphomedusae** the largest Mediterranean species *Rhopilema nomadica*, a recent Lessepsian migrant is a dominant element in summer.in (13). Out of 28 found **Siphonophores**, 18 species are also present in the Red Sea. The bigest group **Copepoda**, includes 109 calanoids from whom, 8 are Lessepsian; (14,15). Among the 50 indo-Pacific species of fish found in the Levantine basin, five larval species were recorded (16), In spite of the oligotrophy characterizing the waters of Eastern Mediterranean and the low primary production striking the Levantine Basin, planktonic community shows a high taxonomic diversity. The biodiversity of the plankton is improving with the allochtonic tropical species mostly coming through the Lessepsian migration.

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