

PATTERNS OF PHYTOPLANKTON COMMUNITY STRUCTURE AND RELATED ENVIRONMENTAL PARAMETERS IN GREEK COASTAL WATERS

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Abstract

Monitoring was carried out along the coastal waters of Aegean Sea during the period March - October 2002 and 2003. The environmental (temperature, salinity, chl a, nutrients) and ecological (phytoplankton species composition, diversity, taxa dominance, community dissimilarities) parameters from five Gulfs of the Aegean Sea are analyzed.

Keywords : *Phytoplankton, Coastal Waters, Aegean Sea.*

This study presents data on environmental (temperature, salinity, chl a, nutrients) and ecological (phytoplankton species composition, diversity, taxa dominance, community dissimilarities) from five Gulfs (Saronikos, Evoikos, Pagassitikos, Thermaikos, Kavala) of the Aegean Sea, E. Mediterranean, collected during March-October 2002 and 2003. The levels of environmental parameters in all Gulfs ranged as follows: temperature 20.1-21.2 °C and salinity 35.5-38.1 psu. The highest (0.71 μM) phosphate concentration was found in Thermaikos Gulf, the lowest (0.21 μM) concentration in Kavala's Gulf and it varied from 0.24 μM to 0.35 μM in the other Gulfs. On the other hand, the highest concentration (17.04 μM) of total inorganic nitrogen (DIN) was found in Pagassitikos Gulf, the lowest concentration (3.32 μM DIN) in Thermaikos Gulf and it varied from 6.47 μM to 9.74 μM DIN in the other Gulfs. Silicate concentration was highest (23.12 μM) in Pagassitikos Gulf whereas it varied from 1.29 μM to 5.77 μM in the other Gulfs. Total phytoplankton cell (range: 1.1x10⁵ - 1.2x10⁶ cells L⁻¹) and chl a (range: 0.47-2.90 mg m⁻³) concentrations displayed a trend among Gulfs: Thermaikos, had the highest abundance of these parameters and followed by Saronikos, Pagassitikos, Evoikos and Kavala's Gulfs.

The Shannon-Wiener index species diversity did not show any significant fluctuations ranging from 1.9 bits/ind. (Gulf of Kavala) to 2.4 bits/ind. (Pagassitikos Gulf). In contrast, the Diatom/Dinoflagellate ratio differed among stations ranging from 7 to 56 and confirmed the predominance of diatoms over dinoflagellates at all Gulfs and so did the number of common species, ranging from 8 to 19, as well, as the number of rare species ranging from 73 to 245. The two predominant diatom species in each Gulf were centric (*Skeletonema costatum*, *Chaetoceros socialis*, *Chaetoceros affine*, *Leptocylindrus minimus*, *Leptocylindrus danicus*, *Rhizosolenia alata*, *Rhizosolenia hebetata*) and pennate (*Nitzschia delicatissima*, *Thalassionema nitzschioides*, *Nitzschia closterium*) forms. The former were more frequent and abundant comprising the 30.6%-54.5% of the total algal community, than the latter (10.5%-25.6%). Analysis of communities dissimilarities [1] indicated considerable differences in assemblage composition between gulfs since the average dissimilarity coefficient of the pair-wise comparisons ranged from 45 to 70 [Table 1].

Tab. 1. SIMPER analysis breakdown of average dissimilarity between Gulf pairs into contributions from each indicator species.

Gulf pairs	Dissimilarity coefficient	Important indicator species (first in order)	Average dissimilarity	Contribution %
Saronikos - Evoikos	58	<i>Ochromonas oblonga</i>	5.35	9.62
		<i>Leptocylindrus minimus</i>	4.59	8.26
Saronikos - Pagassitikos	50	<i>Phaeocystis</i> sp.	4.11	8.60
		<i>Alexandrium minutum</i>	3.27	6.84
Evoikos - Pagassitikos	60	<i>Skeletonema costatum</i>	5.65	9.92
		<i>Ochromonas oblonga</i>	5.61	9.64
Saronikos - Thermaikos	45	<i>Detonula confervacea</i>	3.48	8.30
		<i>Rhizosolenia hebetata</i>	3.14	8.28
Evoikos - Thermaikos	65	<i>Ochromonas oblonga</i>	5.12	8.17
		<i>Chaetoceros socialis</i>	4.94	7.88
Pagassitikos - Thermaikos	55	<i>Phaeocystis</i> sp.	4.22	8.19
		<i>Detonula confervacea</i>	3.54	6.88
Saronikos - Kavala	64	<i>Skeletonema costatum</i>	6.13	10.07
		<i>Rhizosolenia alata</i>	5.67	9.32
Evoikos - Kavala	60	<i>Ochromonas oblonga</i>	6.16	10.80
		<i>Chaetoceros socialis</i>	5.24	9.19
Pagassitikos - Kavala	70	<i>Skeletonema costatum</i>	7.89	11.79
		<i>Leptocylindrus danicus</i>	6.79	10.14
Thermaikos - Kavala	69	<i>Skeletonema costatum</i>	5.29	8.37
		<i>Rhizosolenia alata</i>	5.55	8.30

Reference

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