

### Seasonal variability of some Phytoplankton community structure parameters

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Seasonal variability of two important parameters of phytoplankton structure, species diversity  $H$  and the Diatom/Dinoflagellate ratio, were studied in a coastal station (12m depth) of Saronikos Gulf during the period from 17 November 1988 to 22 January 1990.

Water samples were collected weekly from 1m depth by an Hydrobios sampler and analyzed for chlorophyll-a (UNESCO/SCOR, 1966), while phytoplankton cells were counted in an inverted microscope.

Phytoplankton diversity  $H$  was calculated from Margalef's formula (1958) and the relative contribution of Diatoms and Dinoflagellates to the total standing stock was estimated by the Diatom cell concentration /Dinoflagellate cell concentration. The seasonal variation of Margalef's diversity index and the Diatom/Dinoflagellate ratio was analyzed by spectral and autocorrelation analyses (Legendre & Legendre, 1983).

The ranges and mean values of some selected phytoplankton parameters are given in Table I.

TABLE I. Range and mean value of selected phytoplankton parameters in 1m depth, during the period 17/11/1988 - 22/01/1990.

	Chlorophyll-a $\mu\text{g/l}$	Total Phytoplankton $\times 10^3$ cells/l	$H$ Margalef bits/individual	Diatoms/ Dinoflagellates
Range	0.20-6.95	0.56-447.95	0.14-4.51	0.14-1915.00
Mean	0.88	367.16	2.66	110.88

The autocorrelogram (Fig.1a) for Margalef's diversity index indicated that this parameter has not a dominant and significant seasonal fluctuation. This result was also confirmed by spectral analysis. The lack of a seasonal pattern for the diversity index (fig.2a) could be attributed to the unstable coastal environment. Species diversity is the modulation along a time axis of species evenness by species richness and any positive response of the two components of diversity to environmental "noise" is thus amplified at the diversity level (Legendre, 1973).

On the other hand the autocorrelogram (Fig.1b) for Diatom/Dinoflagellate ratio indicated a significant oscillation of the order of about 20 weeks. This indication was further examined by spectral analysis (fig. 2b), which confirmed that the dominant frequency at the variance spectrum was 0.05 cycles/week (1 cycle/20 weeks), suggesting a seasonal pattern for the Diatom/Dinoflagellate ratio.

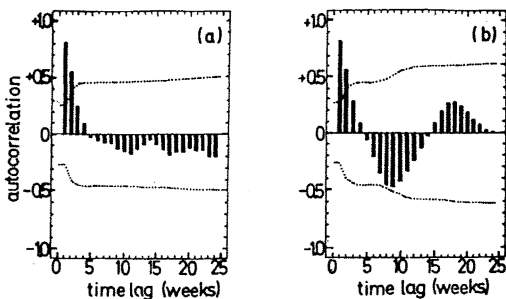


FIG.1. Autocorrelation for: a) Margalef's diversity index, b) Diatom/Dinoflagellate ratio, during the period from 17-11-88 to 22-01-90. Dashed lines indicate confidence interval for a probability of 0.05.

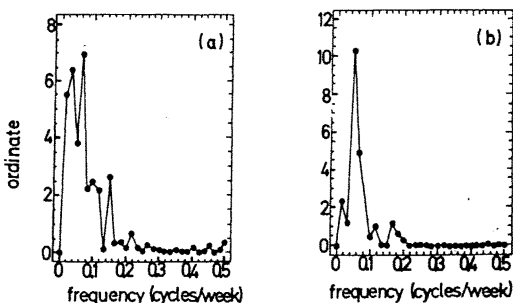


FIG.2 Variance Spectrum for: a) Margalef's Diversity index, b) Diatom/Dinoflagellate ratio during the period 17-11-88 to 22-01-90.

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