PHYTOPLANKTON AND OCEANOGRAPHIC CONDITIONS IN THE STRAIT OF OTRANTO (EASTERN MEDITERRANEAN)

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The Strait of Otranto is the connection between the Adriatic and Ionian Seas. The present knowledge of biological characteristics in the Strait is poor. Other natural characteristics relate mainly to water circulation and thermohaline characteristics.

Water samples (5 l Niskin bottles at 0.5, 5, 10, 20, 50, 75, 100 and 200 m) were collected during five spring-summer case studies (March 1990, April 1987, May 1990, July 1989, August 1986), with the RV "Andrija Mohorovicic", from two stations located across the Strait : the western station 4 and the eastern station 2 (Fig. 1). T-S characteristics were determined with TCD probe. Current measurements were performed in March and May 1990. Maximum thermic gradient of 0.35°C m^{-1} was found along the thermocline in the 10-30 m layer in July and August. Surface salinity values were lower in summer than in spring. Concentrations <0.2 μmol l^{-1} PO4, <2 μmol l^{-1} NO_3, <0.17 μg chl. *a* l^{-1}, 15-36 m Secchi disc visibility, reflect an oligotrophic character of the area (Tab. 1). The most abundant microphytoplankton (MICRO) species were diatoms (7 1 determined species). Dinoflagellates provided high species diversity (73 species), but low population density (mostly ≤10 cells l^{-1}). Diatoms (mostly small cell sized populations) dominated in the total MICRO abundance (43-99%). Relatively higher percentages of coccolithophorids, dinoflagellates and >3000 μm^3 cell-1 diatom fraction were recorded in August 1986. Subsurface chlorophyll maxima were found in the 50-100 m layer. Size fraction <20 μm dominated total phytoplankton biomass. In April and May subsurface accumulation of MICRO cells were also determined (Fig. 1). In summer the reduced MICRO densities are the result of the depletion of nitrate concentrations.

The eastern part of the Strait is mostly influenced by the northerly inflowing current from the Ionian Sea and the western part by the southerly outflowing current from the Adriatic Sea (typical circulation). The most intensive currents were usually recorded between 200 and 500 m with velocities of up to 64 cm sec^{-1}. Slower inflowing/outflowing currents (2-49 cm sec^{-1}) were recorded in the 0-100 m layer. Temperature and salinity values were generally lower, while abundance of MICRO and dinoflagellates higher at the western station 4, indicating southerly outflowing current there. An typical circulation could be disturbed by meteorological factors. Phytoplankton distribution was influenced by currents and complex hydrodynamic conditions. In April and May, differences in east-west distribution of thermohaline characteristics and phytoplankton were significant but due to atypical circulation in the Strait. In April 1987, this might be explained by the occurrence of the cyclonic eddy in the Strait, as have been observed from the satellite images (ARTEGIANI *et al.*, 1993), and stronger inflow of modified Levantine intermediate water into the Adriatic Sea. In May 1990, inertial oscillations in the current field were generated by the strong oscillating wind, resulting in denser phytoplankton population at the eastern station.

Thermal satellite imagery has revealed a greater horizontal thermal gradient across the Strait in winter than in summer (ORLIC *et al.*, 1992). In winter and early spring, stronger currents and east-west gradient of analyzed parameters may be expected.

	Station 4			Station 2		
	min.	max.	mean	min.	max.	mean
Temperature (°C)	13.58	26.30	16.30	13.89	26.36	16.36
Salinity (‰)	37.73	38.97	38.59	37.90	39.04	38.65
Density (σt)	25.03	29.26	28.39	25.15	29.29	28.44
Secchi (m)	15	30	22	16	36	24
PO4 (µmol l^{-1})	0.03	0.85	0.21	0.01	0.78	0.14
NO3 (µmol l^{-1})	0.07	6.68	2.04	0.04	6.85	2.29
SiO4 (µmol l^{-1})	0.06	905	3.37	0.08	7.36	2.52
Chl. *a* - total (µg l^{-1})	0.01	0.13	0.05	0.01	0.17	0.05
Chl. *a* <20 µm (µg l^{-1})	0.01	0.13	0.04	0.01	0.12	0.03
MICRO (cells l^{-1})	$1.4x10^3$	$7.1x10^5$	$1.1x10^5$	$1.4x10^3$	$2.2x10^5$	$6.0x10^4$
BACI μm^3 $cell^{-1}$	1543	158491	22222	1214	55766	9040

Table 1. Minimum (min.), maximum (max.) and mean values of analyzed parameters in the Strait of Otranto. Data for March 1990, April 1987, May 1990, July 1989 and August 1986; 0-200 m layer.

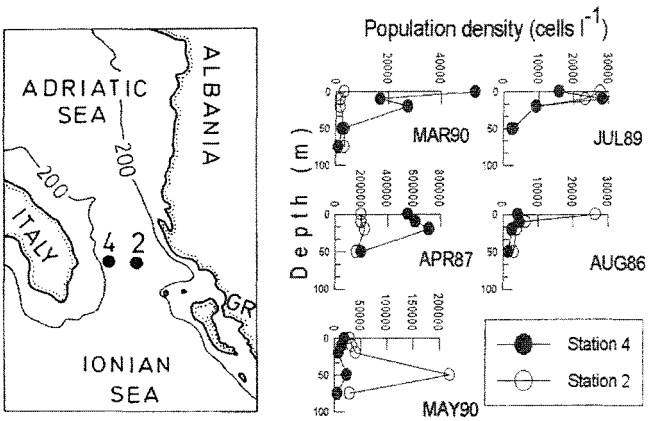

Fig. 1. Map of stations in the Otranto Strait and distribution of microphytoplankton across the Strait during five case studies (note different x-axis labels)

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