

# MICROPHYTOPLANKTON COMPOSITION ACROSS THE FRONTAL SYSTEM IN THE NORTHERN ADRIATIC (FEBRUARY, 2003)

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## Abstract

Microphytoplankton composition was analysed along two transects: Po-Novigrad (PoN) and Pula – Rimini (PR) in the Northern Adriatic Sea, during February 2003. The PR transect was highly influenced by the freshwater discharge from the Po River. A complex frontal system was defined by gradients in salinity, temperature and microphytoplankton composition. Thermohaline gradients along the PR transect were stronger than that along the PoN transect. According to salinity affinity, PCA analysis of species abundance reveals the presence of 4 characteristic groups of phytoplankton in the northern Adriatic.

*Keywords: phytoplankton, Northern Adriatic, salinity, temperature*

## Introduction

Phytoplankton responses to freshwater inputs in the Northern Adriatic have been studied during the last 30 years. The Northern Adriatic is strongly influenced by freshwater inflow from the Po River, with an average yearly discharge of 3600 m<sup>3</sup> s<sup>-1</sup> (1). The results presented in this study describe winter aspect of the phytoplankton community structure in the Northern Adriatic.

## Materials and methods

Twenty-six surface water samples were taken along two transects (PoN and PR) in the Northern Adriatic during a cruise aboard R/V *Knorr* (KN 172-03) between 2-3 February 2003 (Fig.1). Water samples for phytoplankton analysis were preserved in 2% neutralized formaldehyde (final concentration). The phytoplankton abundance was determined according to the inverted microscope method (2).

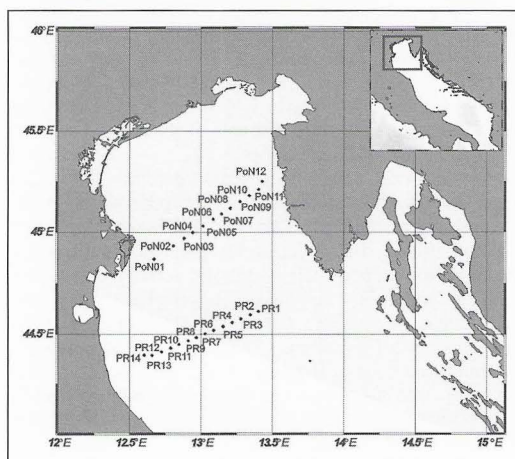


Fig. 1. Northern Adriatic area and sampling locations.

Salinity and temperature were measured underway by the IMET meteorological sensor system.

## Results and discussion

Strong influences by the river Po could be noticed in salinity and temperature dynamics, as well as microphytoplankton abundance across PR transect (Fig. 2). Along the PoN transect, the Po River influence was detected through the frontal system of less pronounced gradients. In both cases microphytoplankton were more abundant in water masses of lower salinity, due to nutrient enrichment by the Po River (1). Principal component analysis on species abundance data revealed the presence of 4 groups (Fig. 3). The first group, strongly influenced by river Po, was dominated by *Thalassionema nitzschioides* and *Dictyocha fibula*. The second group was dominated by the diatoms *Skeletonema costatum*, *Chaetoceros danicus* and some larger dinoflagellates such as *Ceratium furca*, *Noctiluca scintillans* and *Gymnodinium simplex*. The smaller dinoflagellate *Gyrodinium sp.* were also present in the second group as well as in groups 3a and 3b. Group 3a was dominated by the diatoms *Cerataulina pelagica*, *Chaetoceros danicus*, *Diploneis bombus*, *Lioloma pacificum* and silicoflagellate *Dictyocha fibula*. Group 3b, consisting of samples from PoN and one sample from PR transect, could be connected to higher salinity gradients along the PoN transect. Group 3b was dominated by *Chaetoceros danicus* and *Nitzschia longissima/Cylindrotheca closterium*. It is concluded that

*Pseudonitzschia sp.* and *Gyrodinium sp.*, as well as all the species found in group 1 are typical representatives of the Northern Adriatic winter phytoplankton community in higher salinity waters. *Dictyocha fibula* could be considered as representative of the lower salinity community. Other species found in group 3a are considered as species tolerant to lower salinity, but require less turbulent conditions than those found in the proximity of the Po estuary.

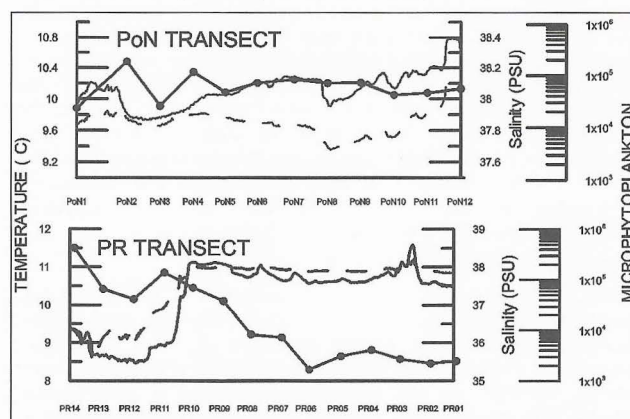


Fig. 2. Salinity (dashed line), temperature (solid line) and microphytoplankton abundance (line with dots) on PoN and PR transects.

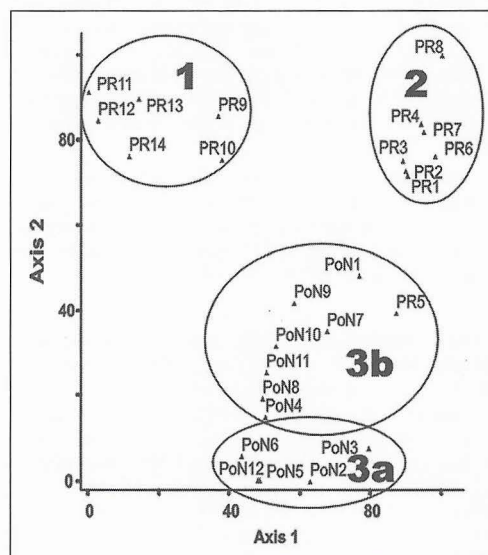


Fig. 3. PCA plot showing distribution of PoN and PR samples. 1, 2, 3a and 3b are groups defined by PCA analysis.

## References

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