

ORGANIC MATTER IN THE KOTOR BAY, SOUTH ADRIATIC SEA

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Abstract

Dissolved organic carbon (DOC), particulate organic carbon (POC) and surface active substances (SAS; NF – nonfiltered, dissolved and particulate, F – filtered, dissolved) were studied seasonally from April 2008 to March 2009 at three locations in the Kotor Bay, Montenegro. Concentrations of reactive part of organic matter displaying surface active properties were compared to the related DOC and POC contents. Temporal distributions are presented in the surface and the bottom layer.

Keywords: Organic Matter, Adriatic Sea

Tab. 1. Ranges of average values obtained for different parameters

	surface	bottom
Salinity	7.5 - 25.9	35.7 - 36.9
Temperature (°C)	11.40 - 27.30	12.93 - 18.53
SAS NF (mg/L)	0.069 - 0.219	0.055 - 0.098
SAS F (mg/L)	0.088 - 0.196	0.045 - 0.091
DOC (mg/L)	0.685 - 1.172	0.842 - 0.971
POC (mg/L)	0.187 - 0.541	0.048 - 0.127

Introduction

Boka Kotorska is one of the best indented parts of the south Adriatic Sea. It is characterised by considerable precipitation quantities and is considered among the rainiest parts of Europe. Coastal Dinaric classical karst of Montenegro is characterised by high degree of karstification and tectonic rupture of carbonate rocks and of flysh barriers [2] which swallow huge quantities of freshwater creating a permanent freshwater inflow to the bay leading to an increase in biological activity (phytoplankton blooms) and, hence, in organic matter content.

Methods

For determination and characterization of organic matter electrochemical method a.c. voltammetry with a nonionic model T-X-100 as a standard was used. DOC and POC analysis were done by high temperature catalytic oxidation (HTCO) method. Emphasis is given to the results obtained for surface and bottom samples since great differences are observed among them – bottom layer is monotonous and less variable in all studied parameters (Table 1).

Results

Permanent nutrient inflow and low salinity (permanent freshwater input) lead to an increase in biological activity (phytoplankton bloom) during 04/2008 confirmed by the highest average SAS NF value indicating presence of fresh, surface reactive organic material in the surface layer (Fig. 1a). With time, fresh organic material SAS NF is transferred in the dissolved fraction accompanied with an increase in average DOC concentration (Fig. 1b). In 07/2008 new surface active material is visible, indicating another increase in biological activity (Fig. 1a). DOC concentration reaches its maximum average value in the summer period (Fig. 1b). During autumn and winter average SAS and DOC concentrations continue to decrease (Fig. 1a, 1b). Average POC values increase from April to May reaching a maximum value, and then decrease slowly toward winter followed by an increase again in 03/2009 (Fig 1c). Interestingly, bottom average DOC values are higher than surface average DOC values in the spring (04/2008, 05/2008, 03/2009).

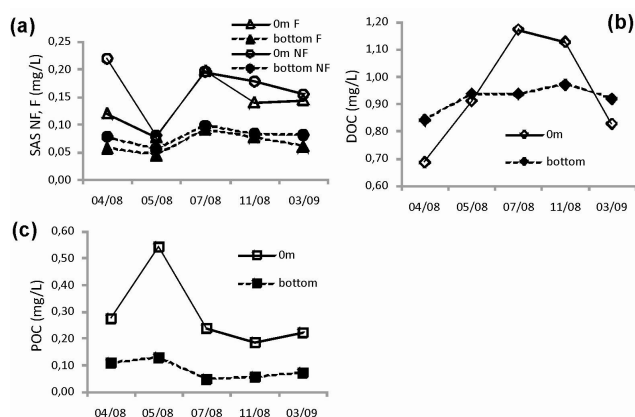


Fig. 1. Seasonal variations of average SAS NF, SAS F (a), DOC (b) and POC (c) in the surface and the bottom layer

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References

- 1 - Krivokapic S. 2008. Chlorophyll a as biomass indicator in the Boka Kotorska Bay. BALWOIS 2008 – Ohrid, Republic of Macedonia – 27, 31 May 2008
- 2 - Magas D. 2002. Natural-geographic characteristics of the Boka Kotorska area as the basis of development. *Geoadria*, 7/1, 51-81