TRACE ELEMENTS IN SUSPENDED PARTICULATE MATTER IN SUBOXIC AND ANOXIC WATER COLUMN OF SOUTH EASTERN BLACK SEA (TURKEY)

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Abstract
In this study, some major, minor and trace elements concentrations (Al, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Mo, Ag, Cd, Sb, and Pb) were determined in particulate suspended matter of suboxic and anoxic layers of the water column of the southeastern Black Sea. Water sampling was made seasonally with rosette sampler. Co, Mn and Ni concentrations of the suspended matter in suboxic layer were found higher than concentrations of anoxic layer as 4; 3 and 2 times respectively. Cu, As, Cr and Pb concentrations of suspended matter in anoxic layer were determined higher than suboxic layer's.

Keywords: Metals, Black Sea, Anoxic basin

Particulate trace elements in aquatic systems has important role in the biogeochemical cycles of many elements of the water column and they distributed over different compartments[1].The suspended particulate matter which contain biotic or abiotic suspended particulate matter, higher organisms such as zooplankton, and the colloidal state has been recognized both as carrier and as possible source of contaminants in aquatic systems affecting their transport, fate, biogeochemistry, bioavailability and toxicity[1, 2]. Because of the biogeochemical cycles of many trace elements are controlled by redox reactions permanently anoxic basins offer unique opportunities to study basic redox geochemistry and the interactions between pelagic processes and sedimentary diagenetic processes [3, 4].

The Black Sea is a semi-enclosed sea and it has a suboxic zone at the interface between the oxic and anoxic sulfidic layers. Althougt there have been several studies of metal distributions of water and sediment sample different part of the Black Sea, trace metal data for suspended particulate matter are still rare [4].

Total suspended matter samples from the suboxic and anoxic layer were collected by rosette sampler. Concentration of measured by ICP-MS (Varian 820) after digestion with microwave digestion procedure of filter. The aim of this study was to determine concentrations of the major, minor and trace elements in the suspended matter of suboxic and anoxic layer of the Black Sea (Coast of Rize, Turkey). The averarage concentrations of particulate trace metals are presented in Figures1 and 2.

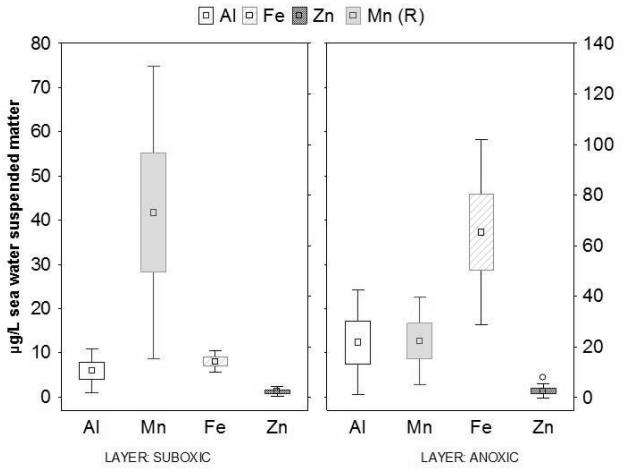

Fig. 1. Al, Mn, Fe and Zn concentrations in suspended particulate matter of the suboxic and anoxic layer of the Black Sea water column.

Metal cycling between dissolved and particulate phases in suboxic zone and metal sulfide formation in the anoxic zone are important processes for metal variabilities in the Black Sea water column. In this study significant correlations were found between metal concentrations in suspended particulate matter especially in anoxic layer.

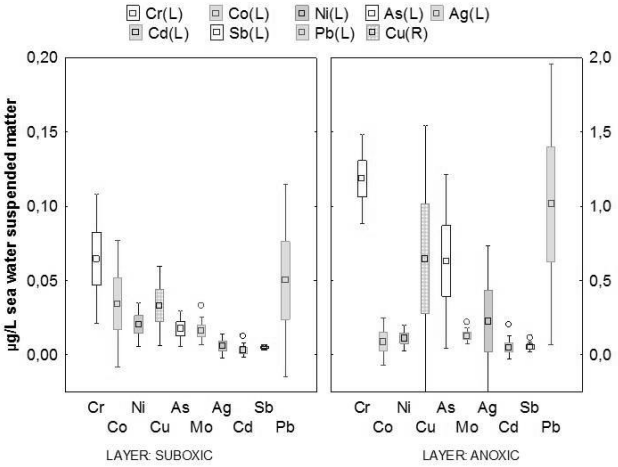

Fig. 2. Cr, Ni, As, Ag, Sb, Co, Cu, Mo and Pb concentrations in suspended particulate matter of the suboxic and anoxic layer of the Black Sea water column.

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