

CONTENTS OF HEAVY METALS IN COASTAL SURFACE SEDIMENTS FROM MONTENEGRIAN COAST

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Abstract

The aim of the present work was to determine the levels of lead, cadmium, arsenic and mercury in coastal surface sediments at three stations located in the „inner shore“ waters Boka Kotor Bay, and at one station located „off shore“ Montenegrin coast, considered as a reference station. The comparison of the results obtained for the „inner shore“ stations with reference station showed that the content of these metals in some station are considerable increased in ratio to reference station.

Keywords: *Sediments, Metals*

Introduction

Also as other areas on Montenegrin coast, this system (Boka Kotor Bay) is also under a great impact of anthropogenic factors and the activities on the shore. The river weighted by sewage, canalization and industrial waters brings large quantities of pollutants into the sea [1]. The material washed from the shore by large quantities of precipitation in Boka Kotor Bay, together with the stationed industrial objects and hospitals on the very shoreline of the Bay, contribute to the pronounced negative anthropogenic impact on this area [2].

Material and Methods

Samples of bottom sediments were taken from a depth of 15-20 cm using a internal diameter plastic gravity corer. Bottom sediments were characterized by amorphous form, brown-green colours, high hydration and significant organic matter content. The sampling was done in autumn of 2005 and 2006 at 4 stations in the Montenegrin coast (Kotor, Tivat and Herceg Novi in Boka Kotor Bay and Mamula, location at the open sea), Fig.1. Dry sample (about 0.3 g) is dissolved with HNO₃+HClO₄+HF (4+1+6). All the samples were examined in laboratory using atomic absorption spectrometer equipped with a deuterium-arc background corrector and Perkin Elmer MHS-10 hydride generator were used. Standard hollow cathode lamps were used for all elements except arsenic, for which a Electrodes Discharge (EDLs) lamp was used. Each samples was analyzed in triplicated.

increase of lead, cadmium, arsenic and mercury on one station in Bokakotor bay can be explained as a area which is under great impact of industry and huge medical complex. Therefore there are numerous scientific studies being performed recently, directed at researching, improving and protecting the natural environment, especially water, as a limited and sensitive natural resource.

References

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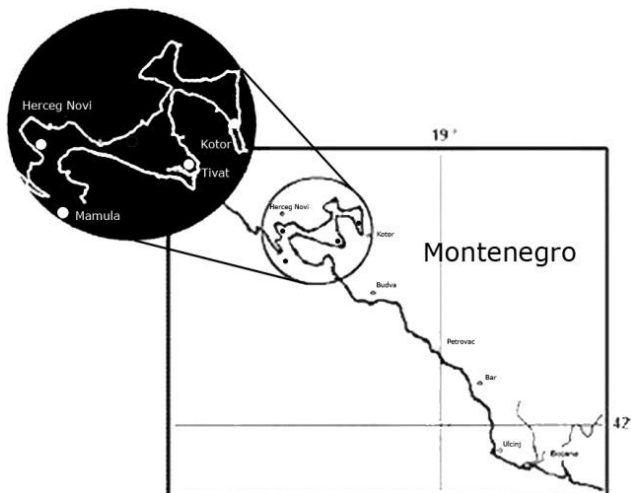


Fig. 1. Map of investigated position (Boka Kotor Bay)

Result and Discussion

The Boka Kotor Bay, as a direct recipient of pollutants of anthropogenic origin from the area, showed the higher contents of Cd, Pb, As and Hg in bottom sediments in 2005 compared to 2006 when values for those heavy metals on every examined locations was much lower [3]. Comparing values of heavy metals on each location in the Bay with referent point (location at the open sea) much higher values of every heavy metal are detected [4]. Content of Cd in the Bay was 0.541-0.869 mg/kg and on the referent point it was 0.4146 mg/kg., Pb (3.722-9.561 mg/kg), As (3.77-5.21 mg/kg) and Hg (0.029-0.098 mg/kg). At the same period of 2006 detected values are much lower and the concentrations was for Cd (0.05-0.074 mg/kg), Pb (0.028-4.79 mg/kg), As (1.75-4.45 mg/kg) and Hg (0.014-0.093 mg/kg). Average contents of heavy metals diminish in series Pb>As>Cd>Hg in 2005, while in 2006 it was in As>Pb>Cd>Hg series. The