

PCBs AND PAHs IN MOROCCAN LAGOON AND RIVER SEDIMENTS

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Abstract

Three surficial sediments from the Martil River and the lagoons of Nador and Moulay Boussselham were analysed for polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs). The level of contamination was low in all samples, with higher values in the river sediments (4,8 and 124 $\mu\text{g kg}^{-1}$ for PCBs and PAHs, respectively).

Keywords: PCBs, PAHs, sediments, Moroccan lagoons, Martil River

Introduction

Sediments, for their characteristics, can be considered as an archive of information on past and present environmental processes. In particular, the analysis of surficial sediments taken from rivers, lagoons and coastal areas can shed light on present contamination levels. Because of this we sampled sediments from several sites representing two areas of great environmental value, such as the lagoons of Nador and Moulay Boussselham, and the Martil River that flows through the industrial town of Tétouan.

Materials and Methods

A short sediment core was taken from a salt marsh in the Lagoon of Nador (north-eastern Morocco) in September 2000. Furthermore, in October 2001 other samples were collected along the terminal tract of the Martil River, whereas the Moulay Boussselham Lagoon was sampled in November 2002. The location of sampling sites is shown in Fig. 1. The concentrations of PCBs and PAHs were determined by GC-MS [1].

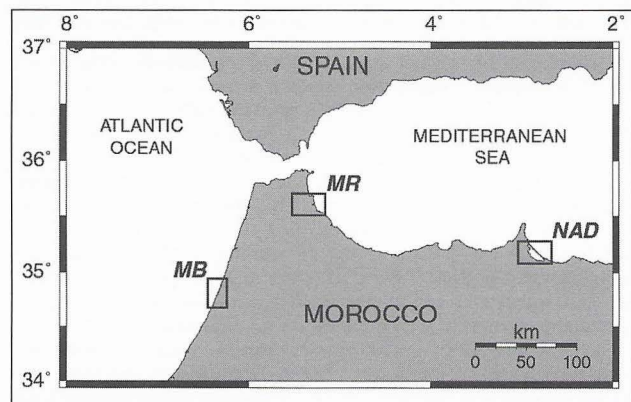


Fig. 1. Location of the study areas: NAD: Nador Lagoon; MR: Martil River; MB: Moulay Boussselham Lagoon.

Results and discussion

Total contents and relative abundances of PCB homologues and PAH congeners are shown in Figs. 2 and 3. All concentrations are low compared to polluted areas [2,3,4], even if the values in river sediments are significantly higher than in the lagoon environments, which can be considered uncontaminated. While the composition of PAHs shows only minor differences at the three sites, the relative abundances of PCBs in the Martil River is significantly different from

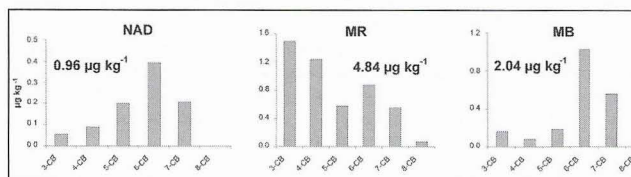


Fig. 2. Concentrations ($\mu\text{g kg}^{-1}$) of total PCBs and homologues in surficial sediments.

those characteristic of the other two locations. In particular, in the Martil River the light PCB fraction (mainly the 3-CB and 4-CB) is rather important, whereas the high molecular weight PCBs are less represented. The clear differences among the three profiles account for the contribution of different sources. Among PAHs, the most abundant is naphthalene, followed by phenanthrene and acenaphthene. Unfortunately, the information is not yet sufficient to decide whether the prevailing source is oil or combustion.

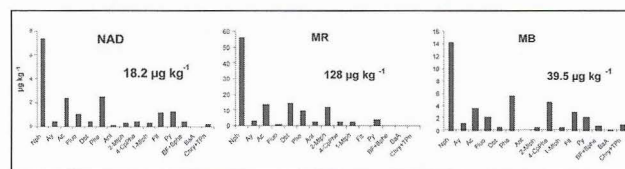


Fig. 3. Concentrations ($\mu\text{g kg}^{-1}$) of total PAHs and congeners in surficial sediments.

The inventories of ¹³⁷Cs calculated for lagoon cores suggest that Nador and Moulay Boussselham sediments are mostly subject to atmospheric contributions.

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