

HEAVY METALS IN THE SUPERFICIAL SEDIMENTS OF BOUISMAIL BAY

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In order to estimate the contamination degree of the Algerian coasts by heavy metal, Bouismail bay has been the object of a preliminary study during the summer 1991. The studied zone was sampled in eight radials among which six were in direct relation with the rivers (Mazafran and Beni-messous) (fig.1). Surface sediment samples were collected by using a Van Veen grab, which takes representative samples by 0-10 cm layer. From the dried sediment samples a quantity of 1 g (< 63 μm) was mineralized with mixture of HCL-HNO₃ (3-1 v/v Ridel-de Haën) during two hours at 120° under a flowing-back column. This treatment methods are those suggested by UNEP/IAEA (1985a, 1985b and 1986). Cadmium, Chromium, Copper, Manganese, Lead, Mercury and Zinc were the metals analysed. The inter-standardization is realized on lyophilised sediment provided by the IAEA (MONACO) and coded SDM2/TM. The analysis is led by a Perkin-Elmer 2380 GFAAS.

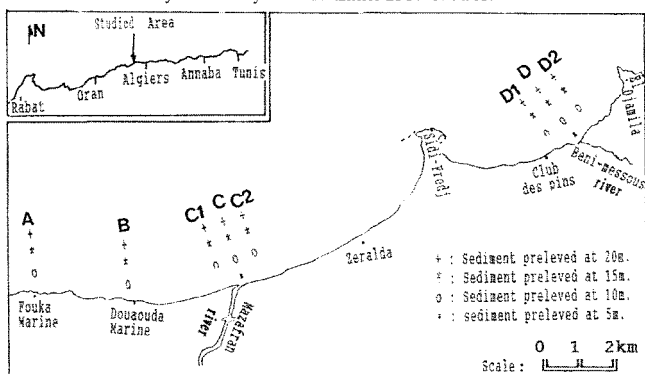


Fig. 1. Bouismail Bay : sampling stations

The high levels of Hg and Pb reflect the existence of pollution sources, essentially in front of the Mazafran river where we found the highest values. The strong variation of these metals is in relation to the important intake of this river which marks out Bouismail bay. Cd variation is due to the diversity of pollution sources, important agricultural activity, urban casting up, etc., on one side and on the other side to the natural variations (DESSAINT, 1987).

Mn and Cr present normal values and their distribution is uniform in the studied zone. However, we may point out that the flocculation effect is very important for Mn (rapid precipitation of this metal to the interface fresh water/salt water). This has been already shown by CHESTER and STONER (1975) in sediments from the lower Severn Estuary and Bristol Channel. Finally Zn and Cu concentrations are variable and the highest are located at the west of Mazafran river. This augmentation is probably due to an anthropic input principally caused by this river, and may also be due to the fertility of this sector in organic substances.

Radials (Bottoms nature)	Hg	Pb	Cd	Mn	Cr	Cu	Zn
A (fine sand)	00.24	14.84	00.56	449.63	72.49	23.52	107.00
B (fine sand)	00.42	16.16	00.27	495.85	73.70	55.16	125.60
C (muddy sand)	00.44	31.42	00.34	417.15	71.85	22.62	72.62
C1 (fine sand)	00.46	25.79	00.95	504.55	73.52	24.82	103.00
C2 (fine sand with shells fragments)	00.40	25.16	00.13	507.30	73.94	22.59	103.59
D (fine sand)	00.045	15.17	00.49	468.25	70.39	15.59	65.30
D1 (fine sand)	00.065	15.48	00.15	484.15	72.33	16.23	85.00
D2 (fine sand)	00.055	18.39	00.33	481.00	73.50	20.10	85.87
Mean	00.265	20.30	00.40	475.98	72.71	25.07	91.00
± SD	00.17	05.89	00.25	28.50	01.12	11.79	20.78

Table 1. Average concentration of metallic element in the superficial sediments of Bouismail Bay ($\mu\text{g/g}$. Dry weight)

The analysis of the heavy metals studied in the superficial sediments of Bouismail bay shows an irregularity in their repartitions. The continental input directly shedded into the bay or indirectly by the slants of the river, the heterogeneity of the bottom sediments and the abundance of biogene particles in this sector are the causes of this variation. However, the metallic pollution at the level of the bay is not alarming and is rather weak in comparison to other sites of the Algerian coast. However, considering the evolution of the agricultural activities in this region and the massive urbanisation along the Bouismail coast, further pollution may be expected for the future.

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