

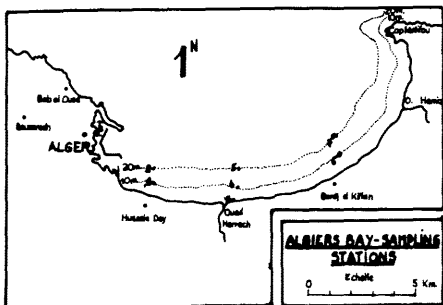
**Heavy metal concentrations contained on the sediment's surface of Algiers Bay**

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**INTRODUCTION :** The aim of this study was, to settle the level of the metals traces of the sediments surface of a zone put under influential anthropical activities.

**I/ Area-studied :** The area observed as well as the stations taken are shown below.



**II/ MATERIALS AND METHODS :** Sediments\* samples were collected with VAN VEEN Grab in seven stations of Algiers' bay. They had been put into plastic bottles and stored at -40 until ready for diagnosis. Moreover, after had been dried by sublimation (at -40°C, 0.1 BARS) for two days; the sediments\* samples were crushed into a porcelain mortar. One gramme of that was taken and put into solution per attack to the aqua-regia water (3v. HCl at 35% + 1v. HNO3 at 65%) during two hours at 80°C under a flowing-back column. The atomic absorption spectrophotometry is used to determine the metals.

**III/ RESULTS AND DISCUSSION :** High concentration of heavy metals (table 1) where observed near river-mouth of El-Harrach. These concentrations fall to a lower level to up to a distance of one kilometer. Lead and mercury gradient from the river-mouth of El-Harrach up to then part's plants showed a considerable increase. These high sedimentary levels are probably dues, in a part, to the pollution caused by the factories implanted in Algiers and its serrrounding, to the intense activity of meters finally to then pouring of impurs waters.

METALS	Zn	Cu	Hg	Cd	Pb
STATIONS					
1	105.50	32.6	5.35	3.42	10.62
2	107.95	33.0	5.48	3.70	10.17
3	137.55	37.4	8.67	7.36	12.38
4	115.95	40.1	8.55	4.28	11.07
5	108.95	36.7	4.48	5.33	8.16
6	156.95	38.2	3.40	6.40	13.69
7	139.85	39.1	3.56	7.20	15.51

TABLE 1 : Trace metals on surface sediments' of Algiers' bay (ug/g)

The data obtained indicate that the average pollution level of the Algiers' Bay sediment, by the heavy metals studies is relatively low to compared to other areas in the mediterranean sea. (Table 2).

Compared to the results obtained in the western mediterranean, the extents of pollution are approximately half lower however they start to present critical aspects.

METALS	Zn	Cu	Hg	Cd	Pb	REFERENCES
STATIONS						
Coast of Romania	4-44	0.48-9.72	-	-	1.6-25.4	PECHEANU 1983
Abu-Kir Bay Alexandria	9-760	0.8-91	-	14.1	-	SAAO et al. 1981
Golf of Veneta	48-450	34-37	-	0.3-5.3	5-5.54	ANGELA et al. 1981
Ebro	32.8-180	7.9-21.5	-	0.16-0.37	22-48	LEON et al. 1983
Occidental Mediterranean	257	51.5	0.57-16	-	32.8	ARNOUX et al. 1982

Table 2 : Trace metals on surface sediments (ug/g)

**REFERENCE**  
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**Metal pollution in the Argostoli Bay, Cephalonia Island, Greece**

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**INTRODUCTION**

Surface sediments from Argostoli bay have been analysed in bulk by Inductively coupled Plasma for Pb, Mo, Zn, Cu, Ni, Cd, Cr, V, Mn, Fe and Al. The samples have been subjected to an HP-HNO<sub>3</sub>-HClO<sub>4</sub> attack prior to analysis. Carbonates were determined using acetic acid leach and organic carbon by titrations (Method K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>.Fe(NH<sub>4</sub>)<sub>2</sub>.(SO<sub>4</sub>)<sub>2</sub>.6H<sub>2</sub>O).

**RESULTS AND DISCUSSION**

Of the metals examined Mo, Pb, Cr, Ni, Co and Zn were found to be enriched relative to normal shallow water sediments their degree of enrichment being decreased in the following order : Mo>Pb>Cr>Ni>Co>Zn.

Manganese, V, Ni and Co follow Al and Fe in their areal distribution suggesting their association with the clays. However, V/Al, Ni/Al and Co/Al ratios at a number of stations are much higher than the average ratio given for near shore sediments. It is therefore concluded that a portion of V, Ni, and Co is held at adsorbed sites in the clays.

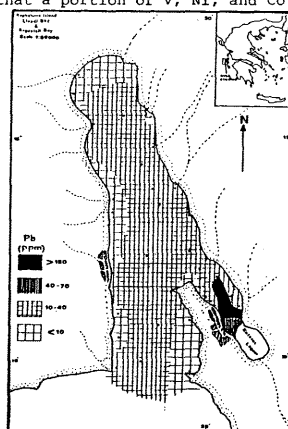


Fig. 1

On average the concentrations of V, Ni, and Co are lower than those reported for other Greek semi-enclosed embayments (1).  
 Lead varies between a few ppm and 206 ppm. The latter value was found in the Argostoli embayment and is close to the maximum concentration of Pb reported for the Thermaikos bay(2). The location of the highest values of Pb would suggest that they should be related to the dissemination of oil in sea from the oil tanks occurring at the eastern coast (Fig. 1). Elevated values of Pb (68 ppm) are also found at the eastern coastal zone of the embayment and they should be due to the discharge of domestic sewage from the town of Argostoli. At the port of Lixouri Pb is 32 ppm while in the rest of the bay is below 30 ppm.

Molybdenum varies between 1 ppm and 43 ppm. Its highest values were found at the inner part of the Argostoli embayment and they decrease toward the outer and deeper parts. Its areal distribution is generally similar to that of organic carbon with which it shows a strong positive correlation (r = 0.80). The highest value of Mo found here is greater than the average value given for near-shore sediments (3). However it is lower than that found in the Navarino and Ithaki bays (4,5).

The highest values of Cu and Zn are found at the outfalls of domestic sewage of Argostoli and Lixouri and generally follow organic carbon. In the rest of the bay Cu and Zn tend to increase in the deeper zones and they show an inverse relationship with the mean grain size of the sediments. The highest concentrations of Zn found in the Argostoli bay is greater than its average concentration in near-shore sediments and is similar to those reported for the Messolongi lagoon.

Cadmium in most of the sediments is below 0.5 ppm except for 3 stations where it reaches the value of 1 ppm. One of these stations is also characterized by high concentrations of Pb and organic carbon.

The areal distribution of Cr, is similar to that of Pb except that elevated concentrations of Cr are also found in the deeper parts of the bay.

Organic carbon varies between 0.04% and 6.20%. Its highest concentration are found in the inner part of the Argostoli embayment and the port of Lixouri, where the domestic sewage of the two towns are discharged. Elevated values of Corganic also occur near the oil tanks existing on the eastern coast of Argostoli embayment. Very low values occur along the western coasts of the area studied.

A negative correlation exists between the concentration of organic carbon and the mean grain size of the sediments, probably as a result at its oxidation in the coarser sediments due to the greater porosity. The greatest values of Corganic are of the same level with those reported for the Navarino and Ithaki bays.

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