

COMPARISON OF GEOCHEMICAL PROPERTIES OF SURFACE SEDIMENTS IN MERSIN AND ISKENDERUN BAY (NE MEDITERRANEAN)

Ismail Akcay ^{1*}, Suleyman Tugrul ¹, Devrim Tezcan ¹ and Elimujiang Ebula ¹
¹ Institute of Marine Sciences Middle East Technical University - ismail@ims.metu.edu.tr

Abstract

In the present study, surface sediment samples were collected at 17 stations selected within the inner sites of Mersin and Iskenderun bays (including city harbors) to examine regional variations of heavy metals (Cr, Mn, Fe, Co, Ni, Cu, Zn), total/organic carbon (TC/TOC) and total nitrogen (TN) concentrations and grain-size distributions in less and highly contaminated sites. Though similar grain-size properties were observed, the surface sediments from the Mersin Harbor and nearby zone fed by wastewater river discharges were highly enriched in organic carbon (8.7-20.1%) with the mean C/N ratio of 11.1. However, Iskenderun inner bay surface sediments with 6.2-16.2% of TOC (C/N:~10.2) were relatively enriched in Cr, Mn, Co and Ni due to inputs from metal industries established along the inner bay.

Keywords: *Metals, Organic matter, Sediments, Mersin Bay, Iskenderun Bay*

Shelf waters of northeastern (NE) Mediterranean (Figure 1), especially the bays of Mersin and Iskenderun, are highly contaminated by direct wastewater discharges from domestic and industrial sources and polluted river inflows [1]. The results in the Table 1 show that metal concentrations (Cr, Mn, Fe, Co, Ni, Cu, Zn) in surface sediments from the Iskenderun inner bay were higher than in the Mersin bay, due to greater inputs from metal industries established in the region. On the other hand, the suspended particles and nutrients carried by regional major rivers to the Mersin bay (Berdan, Seyhan) and wastewater discharges have led to enhancement of TC, TOC and TN in surface sediments of the inner bay and Mersin Harbor region as compared those obtained in surface sediments from the Iskenderun inner bay and Harbor.

Significant and negative correlations were observed between the concentrations of organic carbon and Cr, Co, Ni in the surface sediments whereas TOC and lead concentrations displayed positive correlation, indicating role of organic compounds on the enrichment of lead in the surface sediments of the Mersin Bay.

would like to thank METU-IMS technical personnel for helping geochemical sampling and analyses.

References

1 - Koçak, M., Kubilay, N., Tugrul, S., Mihalopoulos, N. 2010. Atmospheric nutrient inputs to the northern levantine basin from a long-term observation: sources and comparison with riverine inputs. *Biogeosciences*, 7, 12, 4037-4050.

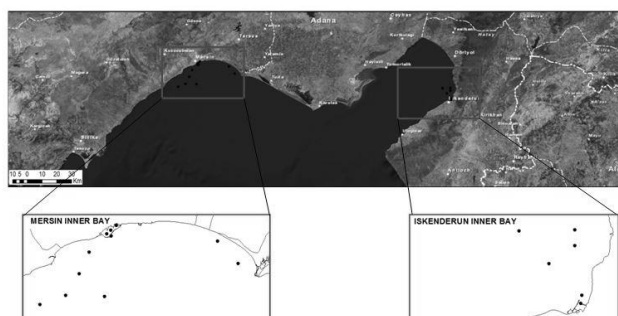


Fig. 1. Sampling stations visited in Mersin and Iskenderun inner bays.

Tab. 1. Concentrations of geochemical parameters in surface sediments from the Mersin and Iskenderun inner bays

Parameters (unit)	Mersin Inner Bay			Iskenderun Inner Bay		
	Mean	Std. Dev.	Interval	Mean	Std. Dev.	Interval
Cr (mg/kg)	255.2	73.2	162.5 - 414.7	666.4	244.7	378.8 - 944.4
Mn (mg/kg)	620.0	110.0	373.7 - 760.0	1082.9	310.7	651.9 - 1593.9
Fe (g/kg)	44.0	7.9	27.3 - 55.3	55.6	4.2	47.5 - 58.6
Co (mg/kg)	27.7	6.7	19.1 - 39.6	46.2	8.9	34.3 - 57.3
Ni (mg/kg)	318.0	127.5	200.7 - 562.7	636.8	151.8	450.4 - 814.2
Cu (mg/kg)	31.1	8.3	20.5 - 49.6	36.4	2.9	31.8 - 39.1
Zn (mg/kg)	90.7	28.5	55.2 - 158.2	119.8	41.5	91.6 - 200.2
Cd (mg/kg)	0.4	0.1	0.2 - 0.6	0.4	0.1	0.2 - 0.5
Pb (mg/kg)	28.2	7.3	17.4 - 44.0	25.5	11.0	16.8 - 46
Al (g/kg)	57.4	12.9	30.9 - 77.1	56.2	5.3	50.9 - 65.1
TC (mg/g)	45.62	8.02	37.01 - 67.62	38.29	5.74	32.06 - 46.21
TOC (mg/g)	6.49	0.73	5.42 - 7.55	4.38	2.04	2.00 - 6.54
TN (mg/g)	0.69	0.11	0.59 - 0.97	0.51	0.25	0.21 - 0.76
Gravel (%)	1.7	2.5	0.0 - 8.7	0.0	0.0	0.0 - 0.0
Sand (%)	32.2	22.2	3.4 - 69.6	38.8	15.4	21.3 - 57.7
Mud (%)	66.1	23.8	28.2 - 96.6	61.2	15.4	42.3 - 78.7

Acknowledgements

This study was supported by TUBITAK within 111G152 (Dredging Applications and Environmental Management of Dredged Material) project. We