HEAVY METAL CONCENTRATIONS IN *HEDISTE DIVERSICOLOR* (POLYCHAETA) AND SEDIMENTS FROM HOMA LAGOON (IZMIR BAY-TURKEY)

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Abstract
Homa Lagoon is the most important fisheries lagoon in Izmir Bay which is under the influence of heavy metal pollution due to the settlement areas, industrial establishments and agricultural activities located around it. In this study, the bioaccumulation levels of some heavy metals such as Cd, Cr, Cu, Pb were measured in the polychaete *Hediste diversicolor* (Müller, 1776), which constitute one of the most significant groups of benthic organisms in terms of number of individuals and number of species, and the sediment they inhabit. Samples were analysed seasonally from Winter 2003 to Winter 2004. The heavy metal mean levels determined for *H. diversicolor* was found to be 0,05 μg/g wet weight for Cd, 1,30 μg/g w.w. for Cr, 3,98 μg/g w.w. for Cu, 10,15 μg/g w.w. for Pb. Mean concentrations of heavy metals in sediments 0,27 μg/g dry weight for Cd, 58,40 μg/g d.w. for Cr, 27,70 μg/g d.w. for Cu, 11,49 μg/g d.w. for Pb in Homa fisheries lagoon.
Keywords : Trace Elements, Polychaeta, Sediments, Aegean Sea.

Introduction
Heavy metals are a major anthropogenic contaminant of estuarine and coastal waters. The main sources of pollution in Izmir Bay are domestic and industrial wastes; rainfall and associated pollutants from run-off; shipping; and agricultured sources. Determination of heavy metal levels in marine organisms and sediments are usually preferred than measuring of the metal concentrations in sea water samples. Sediments contain from three or fives times the concentration of metals in waters. Polychaetes are one of the most significant groups of benthic macroinvertebrate fauna and since these species come in direct contact with the sediments, the potential effect of these toxicants on this group of organisms is of ecological importance. The aim of this study was to investigate the present status of the heavy metal concentrations (Cd, Cr, Cu, Pb) in polychaete *Hediste diversicolor* and the sediment samples collected from Homa fisheries lagoon (Izmir Bay) and compare these sediment results with other study in the same area. Homa Lagoon is located middle part of the Izmir Bay (Aegean Sea, Turkey). It's the only active lagoon that is in the border of the Gediz Delta and has 1824 ha of surface area. It is added to The Ramsar Convention and preserved by the Ministry of Environment in 1998.

Material and Methods
This study was carried out two stations of the Homa fisheries lagoon in the middle bay as indicated in Fig 1.

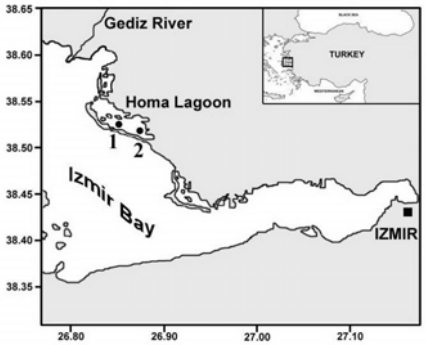

Fig. 1. Map of research area with location of sampling stations.

Samples were analysed seasonally from Winter 2003 to Winter 2004. Polychaete species and sediment samples were collected from these stations at the same time. *Hediste diversicolor* were collected by hand and transported daily to the labroratory. These samples were kept in a deep freeze (-21 °C) until analysis and prepared according to international standart methods [1]. The composite samples of polychaetes were weighed and digested with conc. HNO_3: $HClO_4$ (5:1) (extra pure Merck) under reflux and filtered. Sediments were collected seasonally with a shovel. Each sediment sample oven dried at 60 °C for 24 h and digested with conc. HCl: HNO_3 (3:1) (extra pure Merck) under reflux and then filtered through Watman 40 filter paper. All samples were diluted with bidistilled water and analysed [2]. Metal samples were analysed by using ICP-OES a Perkin Elmer 2000 DV.

Results and Discussion
The concentrations of some heavy metals (Cd, Cr, Cu, Pb) in *Hediste diversicolor* sampled from Homa Lagoon have ranged between; 0,01-0,16 μg Cd/g wet weight, 0,02-11,10 μg. Cr/g w.w., 1,54-10,10 μg Cu/g w.w., 0,23-15,80 μg Pb/g w.w. A large number of studies have been carried out on heavy metal concentrations of various organisms in Izmir Bay but there is no published data about heavy metal concentrations of *H. diversicolor*. The concentrations of heavy metals in sediments varied between 0,03-0,43 μg Cd/g dry weight, 6,53-19,10 μg. Pb/g d.w., 17,20-41,00 μg Cu/g d.w., 33,40-84,90 μg Cr/g d.w. in study area. According to the results, obtained sediments from the study area show heavy metal concentrations similar to those reported for Homa Lagoon (Tab. 1).

Tab. 1. Heavy metal levels in sediment from Homa Lagoon of Turkey (μg/g dry weight).

Locations	Cd	Cr	Cu	Pb	References
Homa Lagoon	1,5-4,5	32,0-80,0	14,0-26,5	-	3
Homa Lagoon	1,6-2,7	38,2-45,5	24,2-28,5	-	4
Homa Lagoon	1,6-2,7	28,2-38,2	14,2-18,5	-	5
Homa Lagoon	0,03-0,43	33,4-84,9	17,2-41,0	6,5-19,1	This study

The Gediz River, which flows to outer bay, is the biggest river in the bay. An important change in Homa Lagoon characterization can be observed according to industrial and agricultural activities along the Gediz River estuary. The order of enhanced metal concentrations found in *H. diversicolor* was: Cd<Cr<Cu<Pb whereas in the sediment the order was diffrerent: Cd<Pb<Cu<Cr. According as the results, heavy metal concentrations of sediments are higher than polychaete concentrations. In conclusion, Homa fisheries lagoon is under the effects of Gediz River which is polluted domestical, industrial and agricultural resources.

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