A Comparative Study on Cr_{tot} Concentrations of Water, Sediments and Some Benthic Organisms of Izmir Bay

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The discharge and dumping of sewage and industrial spoils had released significant quantities of heavy metals in Izmir Bay. Some of these industries such as chemistry, fertilizier, paper, painting, plastics, iron and steel, textile especially well established leather and tinning has been well known as responsible of increased chromium concentration in aquatic environment (IRPTC 1978, KESTIOGLU and SENGUL, 1984). In this investigation chromium content of sediment, water and some benthic organisms collected from Izmir Bay between Dec. 1989 - Dec. 1990 from 11 sampling stations (Fig. 1), has been determined considering with the transportation processes of heavy metals in marine environment.

Water samples were prepared for analyse by solvent extraction technique using APDC-chloroform (KINRADE and VANLOON, 1974). Sediment samples were dried at 110°C for 24 hours and 1 gr of dried samples were wet ashed with $HN0_3$: $HCl0_4$ (1:5). Biological samples were also digested with $HN0_3$: $HCl0_4$ (1:5) (FAO Technical Paper No:158).Cr_{tot} content of the samples were determined using Pye-Unicam Model SP9. AAS with flame technique supported by acetilen-NO_2 fuel.

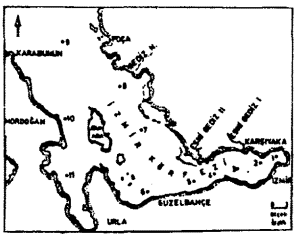

Figure 1. Sampling stations

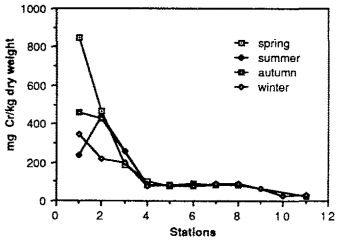

Figure 2. Cr_{tot} concentrations of sediment samples

According to the results of this investigation, there were strong enrichment of Cr_{tot} in sediments of Izmir Bay. Precipitation processes of high organic and inorganic suspended matter which may adsorbe chromium from seawater, gives rise to chromium content of sediment while chromium concentration of sea water is considerably low. The Cr_{tot} concentration in sediment ranged between 26.753-471.150 mg Cr_{tot} kg^{-1} dry weight. It has also apparent that inner bay has the greatest Cr_{tot} content (Fig 2). Literature review shows that Cr_{tot} concentrations of sediment has increased gradually from Sept. 1986 to Sept. 1990 (ALYANAK, 1989, USLU, 1990). It means that Cr_{tot} input to inner bay is a continuous problem.

Cr_{tot} content of sea water were ranged between 5.5-8.5 µg Cr_{tot} l^{-1} with average 7.7 µg Cr_{tot} l^{-1} (Fig. 3).This average value were considerably high as two fold of clean waters of Mediterranean (JEANDEL and MINSTER, 1987; SENGUL and MUEZZINOGLU, 1982; USLU, 1986). On the other hand, this average Cr_{tot} content were comparable with the results of SCOULLOS *et al.* 1982, who obtained 6.6 µg Cr_{tot} l^{-1} from the samples of Gulf Gera (Greece).

Average Cr_{tot} concentrations of muscle of some demersal fish such as *S.vulgaris*, *A.laterna*, *G.niger* and *B.luteum* were determined. *S.vulgaris* had a maximum value in outer by (station number 8) with 663.3 µgCr_{tot} kg^{-1} while lower in inner bay as 257.5 µgCr_{tot} kg^{-1} (Fig.4). Cr_{tot} concent of *B. luteum*, were range between 458.8-198.2 µg Cr_{tot} kg^{-1} while the concentration of were 176.3-1215.0 and of *G.niger* were 132.2-1493.0 µg Cr_{tot} kg^{-1}. Concentration factors of *S.vulgaris*, *B.luteum*, *A.laterna*, *G.niger* were 549.7, 502.7, 708.4, 627.1 respectively.

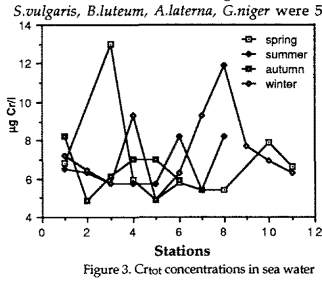

Figure 3. Cr_{tot} concentrations in sea water

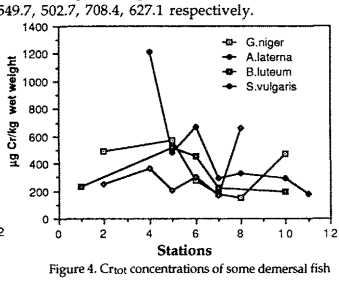

Figure 4. Cr_{tot} concentrations of some demersal fish

Also, *D.annuaris*, *S.alcedo* and *S.scriba* had 382.4, 210.9, 219.0 µg Cr_{tot} kg^{-1} but they were not enough in number to have statistical considerations . Some these values were comparable to the values obtained from the demersal fish sample of Gera bay (Greece) such as 435 µg Cr_{tot} kg^{-1} for *D.annularis*, but some of then were quite low (such as *S.scriba* 35, *S.alcedo* 53 µg Cr_{tot} kg^{-1}) comparing to our results (GRIMANIS *et al.*, 1980).

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