

ABSTRACT

The chromium pollution in the lower reaches (estuary area) of the Kelani river was examined by analyzing chromium levels in abiotic (sediment, water) and biotic (two fish species, *Liza dussumieri* and *Macrones gulio*) components of the aquatic system at 21 longitudinal and cross sectional locations.

The morphology of the sediment of the study area indicated that it was mainly composed of sand (over 80%) except at a few uppermost points on the right bank where the predominant component was silt and clay (over 90%). The total chromium content in the sediment varied between 5 - 103mg/kg with a mean value of 22.9 ± 27.5 mg/kg depending on sampling location. The accumulation of chromium in the silt and clay fraction was found to be 6 - 7 times greater than in the sand fraction. The difference in the distribution of chromium with respect to sampling locations was significant ($P < 0.05$) along the banks and across the river but not along the center of the river.

The chromium concentration of the river water ranged between 10.5-35.6 μ g/l with a mean value of 25.9 ± 4.18 μ g/l. The variation in the distribution was significant ($P < 0.05$) both along the river and across the river. The sediment chromium showed a significant positive correlation with that of water. About 40 fold enrichment of chromium in the river water was observed suggesting that the chromium pollution in the Kelani river occurs in the water phase. In general, physico chemical parameters (pH, salinity, dissolved oxygen, conductivity) of the river water did not have a significant influence on either water or sediment chromium.

The bio accumulation of chromium in the same body organs of the two fish species were similar. However the chromium content in different organs of the same species were significantly different ($P < 0.05$) which followed the order, liver, gill and muscle . A negative trend in chromium bio accumulation with

respect to length/weight parameters was noted for all organs of both species. Significant negative correlations were observed between gill/ muscle chromium content and length/ weight for both fish species, *Liza dussumieri* and *Macrones gullo*, except gill chromium content vs weight in *M.gullo*. However, chromium content in the body organs did not correlate significantly with that of water and sediment.

The two fish species captured from the study area appeared to have 120 - 170 fold bio accumulation of chromium in the fish muscle in comparison to that of the same species captured from unpolluted areas of the Kelani river. However, these levels are at least 10 times lower than those specified by FAO for chromium in edible fish. Therefore, those who consume above fish species captured from the Kelani estuary do not face health risks related to chromium at present.