

ABSTRACT

Heavy metals in rivers of Trinidad and Tobago

Sharda Surujdeo-Maharaj

Heavy metals are priority pollutants because of their environmental persistence, biogeochemical recycling and ecological risks. Rivers are the major source of domestic and drinking water supply in Trinidad and Tobago. Freshwater fish and invertebrates also contribute towards recreation and food supply for locals and hence, bioaccumulation of heavy metals is a serious human health and environmental concern. There is presently little or no information on heavy metals in local rivers.

This project has three major objectives. The first was to quantify heavy metals in the water and sediments collected from 67 sites along local rivers using AAS. In summary, the metals of concern with respect to water in Trinidad and Tobago and sediment in Trinidad were lead, zinc and copper respectively. The metals of concern for sediments in Tobago were copper, nickel and chromium.

The second major objective was to assess the contribution of land use and lithology to the metal loading in these rivers. GIS analysis techniques and regression modelling was used to identify possible natural (lithological) and anthropogenic (land use) non-point sources of these metals. Disturbed land use, erosional formations, calcareous formations and residential land use were found to be associated with high levels of metals in sediments and water in both islands.

The third major objective of the project was to assess possible bioaccumulation of these metals in the Arima, Guanapo and Mausica Rivers. Samples consisting of fish, macroinvertebrate and algae, water and sediments were collected for two sites along each river. Bioaccumulation results indicate that copper, zinc, chromium and lead were biomagnified along different trophic levels. Concentrations of copper, zinc and lead in the muscle of *Astyanax*, *Hemibrycon*, *Hoplias*, *Hypostomus* and *Rhamdia* indicate that locals risk metal contamination when they consume these fishes.

Keywords: heavy metals, sediments, rivers, Chelex 100, landuse regression, bioaccumulation