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## Water Quality and Heavy Metal Monitoring in Water, Sediments, and Tissues of the African Catfish *Clarias gariepinus* (Burchell, 1822) from the River Nile, Egypt

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### ABSTRACT

Water quality of the river Nile and trace elements of the water, sediments and fish tissues were investigated in the current work. Eighteen different sampling points were selected along the whole course of the River Nile from its spring at Aswan to its estuaries at Rosetta and Damietta. Higher mean value of conductivity, alkalinity, chemical oxygen demand (COD), total organic carbon (TOC), ammonia (NH<sub>3</sub>), nitrate (NO<sub>3</sub>), total solid (TS), sulphate (SO<sub>4</sub>), chloride (Cl), orthophosphate were recorded in the water of Damietta and Rosetta branches comparing to other sites. Also trace metals in the water, sediments and tissues of *Clarias gariepinus* increased significantly ( $P < 0.05$ ) from Aswan toward Damietta and Rosetta branch. Such increase proves the presence of large quantities of organic and inorganic pollutants in Rosetta and Damietta water. This was expected due to the fact that the water of such branches receives high concentrations of organic and inorganic pollutants from industrial, domestic as well as diffuse agricultural wastewater. The heavy metal residues in the tissues of *Clarias gariepinus* exhibited different patterns of accumulation and distribution among the selected tissues and localities. It was evident from our study that, liver was the site of maximum accumulation for the elements followed by gills while muscle was the over all site of least metal accumulation. Trace metals accumulations in fish liver at sites under investigation were detected in the following descending order: Zn > Fe > Cu > Pb > Mn > Cr > Cd > Hg. In the gill tissues these metals were accumulated in the following order Fe > Zn > Mn > Pb > Cr > Cu > Cd > Hg. The low accumulation of metals in muscle may be due to lack of binding affinity of these metals with the proteins of muscle. This is particularly important because muscles contribute the greatest mass of the flesh that is consumed as food.

### KEYWORDS

 Water Quality, Sediment, River Nile, *Clarias gariepinus*, Heavy Metals, Aquatic Pollution

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