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Biomarkers in Nile Tilapia *Oreochromis niloticus niloticus* (Linnaeus, 1758) to Assess the Impacts of River Nile Pollution: Bioaccumulation, Biochemical and Tissues Biomarkers

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ABSTRACT

The use of biomarkers has become an important tool for modern environmental assessment as they can help to predict pollutants involved in the monitoring program. Here I present data on bioaccumulation, biochemical and tissues biomarkers in Nile tilapia as early warning indicators of river Nile pollution. Nile tilapia sampled from downstream sites accumulated higher levels of all the detected heavy metals than those collected from upstream sites. Heavy metal residues in the tissues of Nile tilapia exhibited different patterns of accumulation and distribution among the selected tissues. Remarkable alterations in the activities of glucose-6-phosphate dehydrogenase (G6PDH) and lactate dehydrogenase (LDH) in the tissues of Nile tilapia were detected. These alterations were followed, in the present study, by the occurrence of histological lesions in liver and gill tissues of fish collected from the same sites. Alterations in bioaccumulation patterns, in enzyme activities and in histology go in parallel with the elevation in the levels of water chemical parameters detected in the downstream sites as a result of pollution stress in these areas. These results provide evidence that bioaccumulation, biochemical and tissues biomarkers can be sensitive indicators of exposure to mixed pollutants in surface waters.

KEYWORDS

Biomarkers; Bioaccumulation; Enzyme Activities; Histopathology; Nile Tilapia; River Nile

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