

Snails and Fish as Pollution Biomarkers in Lake Manzala and Laboratory B: Lake Manzala Fish

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Abstract : This work aimed to examine *Oreochromis niloticus* fish from Lake Manzala in Port Said, Dakahlya and Damietta governorates, Egypt, as a bio-indicator for the lake water pollution through recording alterations in their hematological, physiological, and histopathological parameters. All fish samples showed a significant increase in levels of alkaline phosphatase (ALP), creatinine and glutathione-S-transferase (GST); only Dakahlya samples showed a significant increase ($p < 0.01$) in aspartate aminotransferase (AST) level and most Dakahlya and Damietta samples showed reversed albumin and globulin ratio and a significant increase in γ -glutamyltransferase (GGT) level. Port-Said and Damietta samples showed a significant decrease of hemoglobin (Hb) while Dakahlya samples showed a significant decrease in white blood cell (WBC) count. Histopathological investigation for different fish organs showed that Port-Said and Dakahlya samples were more altered than Damietta. The muscle and gill followed by intestine were the most affected organs. The muscle sections showed severe edema, neoplasia, necrotic change, fat vacuoles and splitting of muscle fiber. The gill sections showed dilated blood vessels of the filaments, curling of gill lamellae, severe hyperplasia, edema and blood vessels congestion of filaments. The intestine sections revealed degeneration, atrophy, dilation in blood vessels and necrotic changes in sub-mucosa and mucosa with edema in between. The recorded significant alterations, in most of the physiological and histological parameters in *O. niloticus* samples from Lake Manzala, were alarming for water pollution impacts on lake fish community, which constitutes the main diet and the main source of income for the people inhabiting these areas, and were threatening their public health and economy. Also, results evaluate the use of *O. niloticus* fish as important bio-indicator for their habitat stressors.

Keywords : Lake Manzala, *Oreochromis niloticus* fish, water pollution, physiological, hematological and histopathological parameters

Conference Title : ICEES 2016 : International Conference on Environmental and Ecological Systems

Conference Location : London, United Kingdom

Conference Dates : August 25-26, 2016