## INFLUENCE OF PARASITIC INFESTATION AND WATER QUALITY DETERIORATION ON GILL HISTOPATHOLOGY OF OREOCHROMIS MOSSAMBICUS (PETERS, 1852) IN BEIRA LAKE.

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The present study investigated the gill histopathology of Oreochromis mossambicus in relation to the prevalence of fish parasitic infestation and water quality deterioration. Water samples were collected from two sites of Beira Lake from September 2023 to February 2024. Water quality parameters pH, dissolved oxygen, conductivity, nitrates, phosphates, biological and chemical oxygen demand were measured and compared with local and international water quality standards. The data were analyzed using One-Way ANOVA (p<0.05) in MINITAB 14.0. The study recorded spatial variations in Beira Lake including mean conductivity (185.76±7.91 µS/cm), nitrates (1.73±0.0685 mg/L), and phosphates (1.07±0.0584 mg/L) exceeding the Ambient Water Quality Standards for aquatic life set by the Central Environmental Authority, which is 0.4 mg/L for phosphates. The pH values of the Beira Lake range from 6.08±0.568 to 9.34±0.544; has exceeded the standard higher range (8.5) and lower range (6.0) according to the SLSI standard limits. Elevated pH values lead to induced gill epithelial hyperplasia. The mean dissolved Oxygen recorded at Beira Lake was 7.59±0.684 mg/L, which exceeds the Central Environmental Authority ambient water quality limit related to the category C shall be suitable for aquatic life (5 mg/L). Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) were also above the CEA standards, with recorded values of 633.0±105 mg/L and 7.30±0.373 mg/L, respectively, compared to the CEA limits of 15 mg/L and 4 mg/L. Fifteen fish samples of O. mosssambicus were sampled using a cast net from the lake and gills were dissected and subjected to Paraffin- Wax method for the histopathological investigation. Parasites invasion was recorded in all samples with a total prevalence of four ectoparasite species and could be related to the increased organic matter content. Dactylogyrus species, were identified in the gill tissues of the examined fish specimens. Histopathological analysis of the gills of O. mossambicus revealed severe abnormalities, including deformed pillar systems, clubbed tips, epithelial hyperplasia, lamellae fusion and telangiectasia. Result analysis concluded that the associated impacts of ectoparasitic infestation and the water quality deterioration played a significant impact in abnormalities of gill histopathology of O. mossambicus in Beira Lake. The study recommended periodic monitoring of the lake water, investigation of parasites of different fish species inhabiting in Beira Lake, heavy metal contamination in water and sediments along with the identification of key pollution sources.

Keywords: Beira Lake, Central Environmental Authority, Ectoparasite, Histopathology.