

Usability of Fish Haematological Parameters as a Biological Indicator for Freshwater Quality in Badulla District

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Water, the fundamental of life, requires continuous monitoring because water quality deteriorates over time. Fish haematological parameters respond more quickly for environmental changes with more precise results than chemical analysis which conduct periodically. As it is profitable to authenticate eco-friendly method for assessing water quality, this study was conducted to investigate the usability of fish haematological parameters as a bioindicator for assessing freshwater quality. Comparison of physico-chemical parameters of water quality was done in two inland static water bodies in Badulla district: Horabora and Mapakada reservoirs. Results of present study revealed that Transparency, Total Dissolved Solids, Biochemical Oxygen Demand (BOD), pH, Total hardness and Trace metal (As, Pb and Cu) levels were significantly different between Horabora and Mapakada reservoirs ($p < 0.05$). No statistical difference was found for total alkalinity, Dissolved Oxygen level, and Surface water temperature ($p > 0.05$). Both water bodies were identified as polluted in terms of Universal Water Quality Index, although Horabora reservoir was much more polluted than Mapakada reservoir by resulting higher BOD, Total Dissolved Solids, Total hardness and trace metal levels (Pb and As) with less clear water. Blood from Tilapia (*Oreochromis mossambicus*), *Labeo rohita* and *Calla catla* was used for fish haematology analysis. Red blood cell count was significantly different ($p < 0.05$) between two different water bodies for each fish species. Eosinophil count showed a significant difference among two water bodies ($p < 0.05$). The study revealed that a great possibility exists for using fish haematological parameters as a bioindicator for freshwater quality. Moreover, a multi-year continuous study with elaborated investigation require for clarify trends which may exist between fish haematological parameters with respect to water quality changes.

Keywords: Water quality study, Haematology, Tilapia, Eosinophil, Trace metal