COMPARATIVE STUDY OF WATER QUALITY PARAMETERS IN TWO URBAN LAKES IN THE WESTERN PROVINCE OF SRI LANKA.

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The water quality of an aquatic ecosystem has a significant influence on many fields, including ecology, community health, and biodiversity. Thus, continuous monitoring and evaluation of water quality parameters is very important aspect. Present study investigated the different water quality parameters of two urban lakes namely Beira Lake and Ihalagama Lake in the Western Province of Sri Lanka. Both in-situ and ex-situ water quality parameters including temperature, pH, dissolved oxygen (DO), total dissolved solids (TDS), salinity, conductivity, Secchi depth, nitrate, phosphate, biological oxygen demand (BOD), and chemical oxygen demand (COD) were determined in triplicate for four sampling sites from September 2023, to February 2024. Spatial variation of water quality parameters was assessed by one way ANOVA followed by Tukey's pairwise comparison using MINITAB 17 software and Principal Component Analysis (PCA) was done using PRIMER 5.0 software. Water Quality Index (WQI) was calculated using weighed arithmetic index method for all the sampling sites separately. According to obtained results, conductivity, Secchi depth, NO_3^- concentration, PO_4^{3-} concentration, COD, and BOD varied significantly between four sampling sites at 95% level of significance ($P < 0.05$). The Beira Lake had the highest mean BOD level (7.30 mg/L), while the Ihalagama Lake had the lowest value (2.46 mg/L). In the same direction, Beira Lake had the highest COD, nitrate, and phosphate values (633 mg/L, 1.73 mg/L, and 1.07 mg/L, respectively), whereas Ihalagama Lake had the lowest COD, nitrate, and phosphate levels (238.8 mg/L, 0.46 mg/L, and 0.15 mg/L, respectively). Principal Component Analysis (PCA) results clearly indicated that the Beira Lake was characterized by high COD, salinity, conductivity, BOD, phosphate, nitrate, DO, and TDS. Overall water quality of Ihalagama Lake was better than the Beira Lake and it was indicated by obtaining lower levels of BOD, COD, nitrate, and phosphate. Beira Lake was accounted for higher BOD, COD and phosphate levels with respect to central environmental authority standards for ambient water quality parameters. Hence it can be concluded that Beira Lake was more polluted than the Ihalagama Lake. Therefore, it is very important to identify different sources of pollutants and carry out regular monitoring of water quality parameters, particularly in Beira Lake.

***Keywords**: Beira Lake, Pollutant, Principal Component Analysis, Water Quality Index.*