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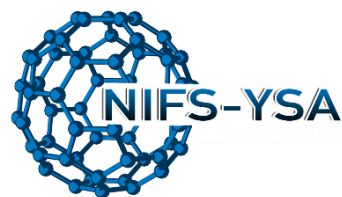
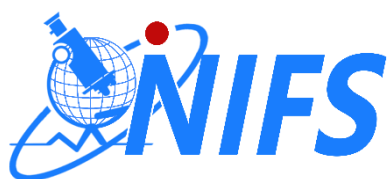
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Chemical characteristics of bulk deposition in Sinharaja and Mattakkuliya, Sri Lanka

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The chemical characteristics of bulk deposition vary with climatic seasons. This study aimed to investigate the chemical characteristics of bulk deposition in Sinharaja, a rainforest site, and Mattakkuliya, an urbanized site in Sri Lanka. During the first inter-monsoon and part of the southwest monsoon in 2023, weekly sampling was conducted at two points using manually prepared high-density polyethylene collectors over a period of five months. The bulk deposition samples were analyzed for pH, electrical conductivity (EC), total dissolved solids (TDS), anions (F⁻, Cl⁻, Br⁻, NO₃⁻, SO₄²⁻, PO₄³⁻), and cations (Na⁺, K⁺, Ca²⁺, Mg²⁺). Cationic species were analyzed using ion chromatography and atomic absorption spectrophotometry. The chemical parameters underwent Pearson correlation analysis using Minitab 21 tested at the significance level of 0.05. The volume-weighted mean concentrations of ionic species in Mattakkuliya and Sinharaja followed this order: PO₄³⁻ < F⁻ < Br⁻ < NO₃⁻ < Mg²⁺ < SO₄²⁻ < Ca²⁺ < K⁺ < Cl⁻ < Na⁺ and PO₄³⁻ < Br⁻ < F⁻ < SO₄²⁻ < Mg²⁺ < NO₃⁻ < Cl⁻ < Ca²⁺ < K⁺ < Na⁺ respectively. In both Sinharaja and Mattakkuliya, strong positive correlations were observed between Na⁺ and K⁺, with correlation coefficients of 0.974 and 0.936, respectively. This finding indicates a close and significant relationship between these two cations in bulk deposition. Additionally, the most substantial positive correlation among water quality parameters was found to be 0.998 between TDS and EC in Mattakkuliya. The results highlighted significant disparities in the ionic concentration of bulk deposition between the two sites. Specifically, the concentration of Na⁺, K⁺, Cl⁻, NO₃⁻, PO₄³⁻, SO₄²⁻, salinity, and pH were found to be significantly different for each location. This study sheds light on the chemical composition of bulk deposition in distinct environmental settings and provides valuable insights into the impact of location-specific factors on the composition of rainwater.

Keywords: *Correlation coefficient, ionic concentration, rainfall season*