

**PHYSICOCHEMICAL ANALYSIS OF MANGROVE SOIL:
MUTHURAJAWELA - NEGOMBO WETLAND COMPLEX, SRI LANKA**

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Mangroves are unique and valuable ecosystems. This study examined some selected physicochemical parameters of mangrove soil and the mangrove distribution according to the salinity and pH levels at the Muthurajawela-Negombo wetland complex. Twenty sampling sites were selected based on the judgmental sampling technique by creating a fishnet grid of 30 m × 30 m. Soil samples were taken from 0 - 15, 15 - 30 and 30 - 45 cm depths from the surface. Soil temperature was measured using a soil thermometer, and other physicochemical parameters such as pH, salinity, and soil organic matter (SOM) were analyzed using standard laboratory methods. Further, a vegetation survey was carried out to study the distribution of mangrove plants in relation to the soil pH and salinity. Results showed that temperature varied spatially from 25.2 °C to 30.0 °C, with the highest temperature recorded in the topsoil layer. Soil pH and salinity spatially varied from 5.39 to 8.31 and 0.56% to 8.83%, respectively. Soil pH did not significantly vary with depth ($p > 0.05$), while salinity increased with the increasing depth. Soil organic matter spatially ranged from 2.56 to 15.70% and also increased with depth. Soils with high salinity tend to accumulate SOM. The correlation analysis revealed a lower positive relationship between soil pH and temperature ($r = 0.15$; $p < 0.05$), and a positive relationship between salinity and SOM ($r = 0.316$; $p < 0.05$). *Rhizophora apiculata*, *Rhizophora mucronata* and *Avicennia marina* were associated more in soils with high salinity (3.72 - 7.15%) and neutral to weakly alkaline pH. *Bruguiera gymnorrhiza* was more prevalent in soils with higher salinity (7.69 - 8.83%) and lower pH, while *Lumnitzera racemosa* was found in acidic to slightly alkaline pH but with low salinity (1.35 - 1.92%) soils. *Sonneratia caseolaris* was recorded in soils with the lowest salinity (0.83 - 1.04%). The findings of the study contribute to decision-making on the conservation and restoration of mangrove projects.

Keywords: Mangrove forests, Physicochemical parameters, *Rhizophora* sp., Salinity, Soil pH