

Mineral Status of Soil and *Avicennia marina* Leaves at the Red Sea Coast, Saudi Arabia

**Ashwaq Rabeh Almohammadi, Abdulahi Bala Alhassan,
Mohammed Othman Aljahdali***

Department of Biological Sciences, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia

Email address:

moaljahdali@kau.edu.sa (Mohammed Othman Aljahdali)

*Corresponding author

Abstract

The Red Sea, renowned as a global biodiversity hotspot, occupies a unique position among marine basins, where the development, size, and productivity of mangroves in this region rely significantly on optimal soil nutrient levels and the high-quality *Avicennia marina* leaves. Thirty samples were collected from the Red Sea coast, comprising both *Avicennia marina* leaves and soil. Subsequent mineral analysis was performed using the Varian 720-ES inductively coupled plasma-optical emission spectrometer (ICP-OES). A significant difference ($p < 0.05$) in macromineral content across six mangrove ecosystems was established in this study. However, Rabigh mangrove stands out with high organic carbon and phosphorus but low in nitrogen, potassium, and sodium, suggesting nutrient imbalances that may impact mangrove growth. The total nitrogen (TN) content in *Avicennia marina* leaves varies significantly across locations ($p = 0.0445$). Rabigh has the highest nitrogen content (1.81%), followed by Thuwal (1.65%) and South Jeddah (1.34%), while the lowest values are recorded in Dahaban (0.53%) and Mastorah (0.52%). This study established those significant variations in macromineral content across six mangrove ecosystems along the Red Sea, reflecting differences in soil nutrient availability, salinity influence, and plant nutrient uptake strategies.

Keywords

Avicennia Marina, Mineral, Soil, Red Sea, Saudi Arabia