

Title: Use of Sediments From A Subtropical Mangrove Ecosystem As A Tool For Monitoring Environmental And Radiation Hazards For the Egyptian Red Sea Coast

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Abstract: The assessment of the radiological characteristics of subtropical mangrove ecosystems along Egypt's Red Sea Coast, focusing on three radionuclides: ^{226}Ra , ^{232}Th , and ^{40}K . Twenty-five sediment samples were collected from three locations: Abu Fasi, Marsa Shaab, Sowmaa, and Sharm el Madfea area of the Egyptian Red Sea coast. The activity concentration values of the nuclides ^{226}Ra , ^{232}Th , and ^{40}K for samples collected from sediments associated with the mangrove environments were measured. These samples were tested using gamma-ray spectrometry. The radiological hazard indices, including radium equivalent activity, internal/external hazard indices, and gamma/alpha indices, were calculated. The findings indicated lower concentrations of ^{226}Ra and ^{232}Th in the samples from Abu Fasi and Sharm el Madfea compared to those from Marsa Shaab and Sowmaa. The highest average values were observed in samples collected from Marsa Shaab and Sowmaa mangroves ecosystem for the ^{226}Ra and ^{232}Th . However, the highest average value for ^{40}K was measured in samples collected from the Sharm El Madfea area. The radiological hazard values for these samples were below the worldwide recommended limits, suggesting they are safe for use in industrial applications. Calculations showed all indices were well below the thresholds for concern. This means the sediments are safe for use and do not pose significant radiation exposure risks to humans or the environment.

Keywords: Mangrove plants Gamma spectroscopy Radiation hazard HPGe

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