

**POTENTIAL OF HEAVY MINERALS AROUND THE KOKKILAI LAGOON OF
NORTHEAST SRI LANKA**

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Extractable mineral sand deposit at Pulmoddai extends about 7.2 km along the beach from Arisimale to the Kokkilai lagoon mouth of the northeastern coast of Sri Lanka. The exploiting rate of minerals is higher than the replenishing rate; therefore, it is important to investigate the source of deposits or any other alternative deposits. Thus, geochemical and mineralogical studies were carried out to assess the heavy mineral potential around the Kokkilai lagoon region. Sixteen surface sediment samples were collected from the perennial river inputs of the Kokkilai lagoon, lagoon bottom and along the coast of the lagoon mouth. Mineralogical studies with X-ray Diffraction (XRD) revealed the heavy minerals rutile, ilmenite, monazite and zircon from all samples. The XRD graphs showed a high percentage of rutile and ilmenite for the perennial river inputs. X-ray Fluorescence (XRF) technique identified the available oxide contents of each sample, and a significant amount of Fe₂O₃, TiO₂ and ZrO₂ were recognized from the river inputs and lagoon bottom compared to the most other riverine sediments of the country, including the Mahaweli River. The Kokkilai lagoon river inputs flow through the Wannai Complex rocks, characterized by thick sequences of orthogneisses comprising amphibolite-grade migmatitic, granitic, and granodioritic gneisses, charnockites and calc-silicate rocks. These particular rock types included higher percentages of heavy minerals that may be the reason for the presence of above oxides and high content of heavy minerals. Wave activities of the beach have sorted with its characteristic specific gravity and piled up the heavy minerals along the coast than the river inputs and lagoon bottom of the Kokkilai lagoon. Hence, the perennial rivers of the Kokkilai lagoon might be the primary agents for the heavy minerals in the northeastern coast that earlier postulated aeolian origin. The high concentrations of heavy minerals recorded in the Kokkilai lagoon region can replenish the coastal deposits in the future, which needs to be further investigated.

Keywords: Heavy minerals, Kokkilai lagoon, Northeastern coast