

## **Microplastics in Beach Sediments of Kalutara Coastal Line, Sri Lanka: Abundance and Characteristics**

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### **Abstract**

Beach microplastic pollution is a globally widespread problem, posing an immediate threat to the health of aquatic species. Data regarding microplastic contamination in beach sediments in Sri Lanka is still lacking, specifically for the Kalutara coastal line, which is an important beach due to tourism. This study was performed to assess the abundance, and characteristics; shape, color, and polymer types of microplastics in beach sediments of coastal line Kalutara (500 m distance towards South and North from Kalutara Bridge). Five sand samples were collected from each side within a quadrant (30 cm × 30 cm) and 5 cm depth. Microplastics were extracted from 1 kg of dried sediment through density separation using saturated NaCl followed by digestion using Fenton's reagent. Since most of particles were found on 2 – 5 mm sieve, they were subjected to further characterization. After the identification of their polymer type by Attenuated Total Reflection Fourier transform Infrared (ATR-FTIR) spectroscopy, the number of microplastics were counted. The average microplastic abundance was 14.0±1.9 particles/kg. Both lowest (3.0 particles/kg) and highest (26 particles/kg) abundances were recorded for the South coastline indicating an uneven microplastic pollution. Similar abundances (4.0 particles/kg) were recorded for the sediment collected at sea mouth of both South and North coastlines. Film- shaped (48.57%) and microplastics in white color (39.29%) were most frequently found. Twenty-eight polymer types were identified, and high-density polyethylene was the most abundant (23.57%). The findings conclude polythene bags as a major source and provide a baseline for future studies on microplastics pollution.

**Keywords:** *Polyethylene, Sediments, ATR-FTIR, Microplastic films*