



Composition and Abundance of Marine Debris on the West Coast of Sri Lanka

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Marine debris, particularly plastic waste, is a major environmental problem in coastal ecosystems due to its persistence and harmful impacts on marine biodiversity. This study investigated the accumulation of marine debris on selected beaches along the western coast of Sri Lanka. Field surveys were conducted at four coastal areas, Mattakkuliya, Dehiwala, Moratuwa, and Panadura, from September to November 2022 using the belt transect sampling method. Each location was visited three times during the three-month study period. Surveys were carried out across the high, mid, and low-tide zones, with two 20 m² transects established per sampling visit. Debris items were categorized into household consumables, abandoned, lost, or otherwise discarded fishing gear (ALDFG), medical waste, X-Press Pearl-related plastic pellets, and other synthetic materials. Material types, including PET, HDPE, PVC, LDPE, PP, PS, and nylon, were identified through visual examination based on physical characteristics such as texture, flexibility, color, shape, and manufacturer markings. Items were further classified according to polymer type, color, and shape. Coastal pollution levels were assessed using the Clean Coast Index (CCI), and the observations were analyzed quantitatively using statistical methods and qualitatively through Qualitative Data Analysis (QDA). A total of 5,796 plastic items were recorded across the four study areas. The highest proportion of plastic debris was recorded at Mattakkuliya (68%), while Moratuwa and Dehiwala contributed 13% and 12%, respectively. The lowest amount of plastic debris was collected at Panadura Beach (7%). Clean Coast Index (CCI) values classified all surveyed locations as extremely polluted. Debris accumulation was greatest within the high-tide zone. Household consumables constituted the dominant debris category (77%), followed by ALDFG (14%). These findings emphasize the urgent need for improved waste management practices, continuous monitoring programs, and increased public awareness initiatives to mitigate coastal pollution and protect marine biodiversity.

Keywords: *Marine debris, Biofouling, Plastic waste, Coastal pollution, Clean Coast Index (CCI).*