



FIRST EVIDENCE OF MICROPLASTICS IN BEACH SAND FROM NEGOMBO, SRI LANKA AND THE POTENTIAL ACCUMULATION IN MARINE FISH

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ABSTRACT

Prevalence of microplastics in the marine environment has been a growing problem as they can impose deleterious impacts on marine biota. Though the issue has a global concern, it has not been taken up in Sri Lanka. The present study is the first attempt to study the occurrence of microplastics in beach sand in Sri Lanka from three study sites namely, Pitipana, Catamaran, and Dūwana beaches in Negombo along the western coastline. Samples were collected bi-monthly between March and November 2017. Microplastics were separated using density separation with the aid of vacuum filtration and categorized into two size classes (1-5 mm and <1mm). Identification of the 1-5 mm category as fiber, foam, fragment, and pellet was conducted visually using a stereo microscope and enumerated. Polymer types of the microplastics less than 1mm were determined by analyzing the FTIR spectrum. In addition, the gut contents of *Sardinella* sp. caught from Pitipana was analyzed for microplastic ingestion by visual observation as well as identification of the polymer. Results showed that the Catamaran and Dūwana beaches were contaminated with microplastic fragments (25 and 13 items per m³ respectively) followed by fiber (2 and 1 items per m³ respectively). At Pitipana beach, significantly high number (36 items per m³) of foam plastics were recorded. However, pellets that are used for plastic manufacturing were not recorded in any of the sites. In Pitipana beach, only polyvinyl chloride was found whereas in Dūwana and Catamaran beaches only polyester as polymer type. The FTIR analysis of gut content of the *Sardinella* sp revealed that contamination of polyethylene suggesting the presence of microplastics in sea water and potential for accumulation in marine biota. Further it was found that all the microplastics were secondary origin through the breakdown of larger plastics into smaller particles.

Keywords: Microplastics, beach sand, Sri Lanka, fish ingestion