

Microplastics Pollution in Garanduwa Lagoon, Matara, Sri Lanka

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Microplastics (MPs) are becoming a global ecological threat on aquatic ecosystems and it has been identified as an emerging pollutant in Sri Lankan water bodies. Under this context, lagoons are highly vulnerable, as those act as a sink for an array of pollutants. Although there were few studies of MPs conducted in coastal beaches, information on MPs pollution in Sri Lankan lagoons is largely unknown. The present study attempted a qualitative and quantitative assessment of MPs in water, sediments, and fish in the Garanduwa lagoon, Matara, Sri Lanka. Sediment and water samples were collected from five sites of the lagoon using an Ekman grab and a plankton net (30 μm) respectively. Edible fish species were collected from the commercial catch. Density separation was performed with 1.2 g cm^{-3} NaCl solution followed by a digestion using 30% H_2O_2 . Fish samples were digested by using 10% KOH. The total number of MPs in water and sediment ranged from 0.46 ± 0.08 to $0.21 \pm 0.05 \text{ L}^{-1}$ and from 283 ± 71 to $97 \pm 15 \text{ kg}^{-1}$ of dry weight respectively. The mean abundance of MPs in three different fish species (*Oreochromis niloticus*, *Mugil cephalus* and *Etroplus suratensis*) were ranged from 5 ± 1 to 2 ± 1 particles per individual. Fibers, fragments and pellets were the main plastic types present in sediment, water and fish samples. Polyester, polystyrene, polyethylene and polypropylene were the major polymer types found in the samples. The Bio Concentration Factor (BCF) of fish species ranged from 50.6 to 63.83, and there is no evidence of MPs bio magnification. This emphasizes the need for further research into the complexity of microplastics toxicity on human body.

Keywords: Microplastics, Lagoon, Sediments, Southern Coast, Sri Lanka