



Microplastic Contamination in Selected Commercially Important Fish Species in Weligama Bay, Sri Lanka

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Microplastics cause substantial negative impacts, especially on marine life, with deepening concerns about human health consequences via seafood consumption. Therefore, this study assesses the microplastic contamination in commercially harvested *Sardinella gibbosa* and *Leiognathus equula* in Weligama Bay. Gills, gastrointestinal tracts (GIT), and muscles of 12 individuals of each species were digested separately, using 10% KOH at 45 °C for three days, followed by density separation with saturated NaCl solution. Nile red staining was used to visualise microplastics under fluorescence microscopy. Procedural blanks were conducted throughout the laboratory analysis. Microplastics were identified in all examined individuals. The prevalence of microplastics in gills was 100%, whereas GITs and muscles recorded a prevalence of 87.5% and 79.2%, respectively. A total of 180 microplastic particles were identified in all the fish samples, with a mean abundance of 1.41 ± 0.07 particles g⁻¹ in *Sardinella gibbosa* and 1.13 ± 0.38 particles g⁻¹ in *L. equula*. A significant difference in microplastic abundance was detected among tissues within both species ($p < 0.05$). The mean abundance ranged from 0.38 ± 0.37 particles g⁻¹ in muscles to 11.13 ± 9.18 particles g⁻¹ in gills in *Sardinella gibbosa*, while a range of 0.33 ± 0.30 particles/g in muscles to 6.88 ± 4.89 particles g⁻¹ in GITs was recorded in *L. equula*. Only the gills showed a significant interspecific difference in microplastic abundance ($p < 0.05$). Fibre was the dominant microplastic type, and blue was the dominant colour. The 0 – 100 µm and 100 – 500 µm size classes were prominent in *Sardinella gibbosa* and *L. equula*, respectively. However, no significant correlation between microplastic abundance and total weight or length ($p > 0.05$) was recorded in either species. Therefore, these findings on both edible and non-edible fish tissues necessitate long-term monitoring and remediation measures of microplastics in fish in Weligama Bay, as these can pose health risks and influence its tourism-driven economy.

Keywords: Fish tissues, Weligama Bay, Prevalence, Abundance, Microplastic characterisation