



Microplastic Contamination of Commercial Ice Used in Fishery Industry in the Western Province, Sri Lanka

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Microplastic (MP) pollution in fisheries is an emerging environmental concern, particularly in commercial ice used for fish preservation. This study aimed to quantify MP levels and characterise their types and colours in commercial ice collected from Negombo, Dikkowita, Beruwala, and Panadura Fishery Harbours, Sri Lanka. Ice samples were collected from three major factories and multiday boats in each harbour. A total of six sampling points was taken in each harbour, including factory-originated ice (Factory 1, Factory 2, Factory 3) and ice from multi-day boats post-transportation (Boat 1, Boat 2, Boat 3). Samples were obtained from three ice factories and three multiday fishing boats within each harbour, representing factory-produced ice and post-transportation boat ice. One-liter ice samples were collected, processed, and analysed to determine MP concentration, morphology and colour composition. MP contamination was detected in all samples, with fragments being the most abundant MP type in both boat and factory ice samples. The Negombo Fishery Harbour exhibited the highest MP concentration with mean levels of 125.0 ± 47.6 MPs L⁻¹ in boat ice and 110.7 ± 41.3 MPs L⁻¹ in factory ice. Comparable but slightly lower concentrations were observed in Beruwala (122.2 ± 9.3 MPs L⁻¹ and 69.3 ± 16.7 MPs L⁻¹) and Dikkowita (95.8 ± 30.4 MPs L⁻¹ and 85.0 ± 32.1 MPs/L), while Panadura exhibited the lowest levels (66.9 ± 10.5 MPs L⁻¹; 54.5 ± 15.4 MPs L⁻¹, respectively). Statistical analysis using one-way ANOVA indicated no significant difference in MP concentrations between factory and boat ice samples ($p = 0.132$), suggesting that contamination may primarily originate during ice production rather than transportation. This study underscores the widespread presence of microplastics in commercial ice used in the fisheries sector of Sri Lanka, emphasising the need for improved ice production practices and better contamination control to ensure food safety and public health.

Keywords: *Commercial ice, Microplastics, Water quality, Fishery harbours*