



Microplastic Contamination in Edible Clams (*Gafrarium tumidum*) from Kinniya Lagoon, Eastern Sri Lanka: Baseline Evidence for Lagoon Pollution Monitoring

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Microplastic (MP) pollution is an emerging environmental concern with potential human health risks. However, studies on MP accumulation in edible clams from Eastern Sri Lankan lagoons are limited. This study investigates the presence, abundance and characteristics of microplastics (MPs) in *Gafrarium tumidum* from Kinniya Lagoon, along with selected water quality parameters at key harvesting sites. Three sites were selected: Periyatrumunai (PM), Mayiltheevu (MT) and Kaakaamunai (KM). Eighteen clam samples were collected, with six from each location, wrapped in aluminum foil, along with water and sediment samples in triplicate. Clam tissues were digested (10% KOH), incubated at 50° C for 24 hours. Then density separation (1.2 g/cm³ NaCl) was then performed on all clam, sediment and water samples. Further digestion (30% H₂O₂) was applied to all samples, followed by filtration using 0.45 µm GF/F filter papers. Classification was based on size, color and shape using a camera-assisted stereomicroscope. The mean concentrations (±SD) of MPs in clam samples are 1.4 ± 1.1, 0.6 ± 0.3 and 0.7 ± 0.4 items/g at PM, MT, and KM locations, respectively. There were no significant differences in MP abundance among locations (p=0.699). Fibers were the most dominant MPs type with a (96.77%) and blue is the most prevalent color (54.84%). The size of MPs ranged from 26.2 µm to 4800 µm across all clam samples. KM recorded the highest MPs in water (6.7 ± 4.6 particles/L), whereas PM recorded the highest MPs in sediment (0.02 ± 0.005 particles/g). There were no significant correlations between MP abundance in clam samples, water and sediment (p > 0.05). At 27° C, PM had the highest pH (8.61 ± 0.02) and TDS (14.57 ± 0.06 ppm) than other two sites, while MT had the highest salinity (21.42 ± 0.02 ppt) and EC (35.72 ± 0.03 mS/cm). This study provides baseline evidence of MP contamination in edible clams from Kinniya Lagoon, indicating potential ecological and human health risks and highlighting the need for improved waste management and monitoring.

Keywords: Aquatic pollution, Edible clams, Density separation, Microplastics, Fiber