

## **Spatiotemporal variation of microplastics in coastal ecosystems: A case study in Rekawa lagoon**

Somarathna R.G.S.M.,<sup>1</sup> Gangabadage C.S.,<sup>1\*</sup> Yapa Y.M.A.L.W.,<sup>1</sup> Atapaththu K.S.S.<sup>2</sup>

<sup>1</sup> *Department of Chemistry, University of Ruhuna, Sri Lanka*

<sup>2</sup> *Department of Limnology and Water Technology, University of Ruhuna, Sri Lanka*

Microplastics (MPs) have been studied across coastal waters as they impact on ecological integrity of those sensitive ecosystems. Under this context, spatiotemporal variability of MPs level is a potential confounding factor to be concerned. The present study describes short-term spatiotemporal variability of MPs distribution in water and sediments, and selected fish species in Rekawa lagoon, Sri Lanka. Samples were collected in three occasions from November 2023 to January 2024 selecting eight locations of the lagoon. Water samples were collected using a plankton net (30  $\mu\text{m}$ ), while sediment samples were collected using a PVC Corer. Five different edible fish species were collected from the commercial catch. Density separation was performed using 1.2  $\text{g}/\text{cm}^3$  NaCl solution followed by digestion with 30%  $\text{H}_2\text{O}_2$ . Fish samples were digested with 10% KOH at 60  $^\circ\text{C}$ . The polymer type and the level of degradation were identified using FTIR spectroscopy. The highest MPs concentrations of sediment ( $80.00 \pm 26.45$  items/kg) and water ( $0.50 \pm 0.19$  items/L) were recorded in December, whereas the lowest values were found in January for sediment ( $56.66 \pm 15.27$  items/kg) and water ( $0.24 \pm 0.17$  items/L). The MPs concentration in fish species ranged from 1-4 items/individual in guts and gills. The heavy rain and excessive riverine influx might have carried plastic debris to the lagoon in December. Fiber was the most prevalent plastic type collected from water, sediment, and fish species and most of them were  $<1\text{mm}$  in size. Polyethylene, polypropylene and polyester were the major polymer types and most of them were partially degraded. Further, it emphasizes the need for further research towards the accumulation of MPs in coastal ecosystems and their toxicity on human.

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\*Corresponding author: [chinthaka@chem.ruh.ac.lk](mailto:chinthaka@chem.ruh.ac.lk)