

MICROPLASTIC POLLUTION IN SELECTED MANGROVE ECOSYSTEMS OF SOUTHERN SRI LANKA

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Over the past decade, microplastics (MP < 5 mm) have received global attention and have raised concerns about the negative impacts on both aquatic and terrestrial environments. To date, mangrove ecosystems (ME) present at the intersection of land and sea have been identified as a potential sink for MP due to various environmental characteristics, such as the complex root system in ME and slow-moving water that facilitates sedimentation. As mangrove ecosystems provide diverse ecological conditions for both fauna and flora, there is a crucial value in evaluating the different types of MP present in the ME and quantifying the abundance and distribution of MP in the different MEs. This study was carried out to recognize the types of MP, their distribution, and the environmental factors that affect MP in five selected ME, i.e., Hikkaduwa, Rathgama, Koggala, Galle, and Rekawa in Southern Sri Lanka. Soil and water samples were collected from 180 sampling points in the selected ME using standard sampling methods and equipment. Sediments were digested following the oxidative reduction method, and MP extraction was done using density separation and filtration. Microplastics were counted and categorised according to the particle shape, size, and colour. Data were analysed using Minitab (v. 21) and SPSS software. Both the mean number of MP per litre of water (MPW) and per kg of dry weight of sediments (MPS) were highest in Hikkaduwa (MPW: 16.00 ± 5.06 , MPS: 79.17 ± 71.33) and lowest in Rekawa (MPW: 8.00 ± 3.58 , MPS: 34.38 ± 48.26) with a no significant difference among the study sites ($p > 0.05$). MP were identified as two major types, i.e., filaments and fragments, and those were also highest in Hikkaduwa compared to the other sites. Filaments and fragments were detected in eight different colours; black, white, blue, green, red, grey, pink, and transparent. This study provides crucial information on MP pollution in the ME of Southern Sri Lanka, emphasizing the significance of mitigatory measures to control the impact of MP on overall environmental well-being.

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