



## MICROPLASTIC POLLUTION ALONG THE ATTANAGALLA RIVER, SRI LANKA

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### Abstract

Microplastics are identified as an emerging environmental contaminant in recent decades. Understanding the prevalence of microplastics in the environment is required to mitigate unfavorable consequences. Freshwater environments are at a greater risk of microplastics pollution due to frequent anthropogenic interaction. Microplastics studies on rivers have been suggested as a pathway to identify the sources and drivers of microplastics pollution. The present study was conducted to evaluate the microplastics pollution from headwater to downstream along the Attanagalla River. The surface water and sediment samples were collected from fifteen sampling sites along the river in May and October of 2019. Surface water samples were collected using a plankton net (circular opening of  $d = 20$  cm,  $100 \mu\text{m}$  mesh) and sediment samples were collected deploying a Van Veen grab sampler (HYDRO-BIOS 4373330 Kiel, Germany). Wet peroxide digestion was carried out to remove organic matter in surface water and sediment. Suction filtration technique was used to extract the microplastics. Identification and classification of microplastics were done under the inspection of a stereomicroscope (Nikon SMZ 1270i, Japan). Microplastics were found in all the samples studied. Abundance of microplastics in surface water ranged from  $1.12 \text{ m}^{-3}$  -  $17.45 \text{ items m}^{-3}$  and in sediment  $11.38$  -  $129.47 \text{ items kg}^{-1}$ . The river microplastics load exhibited an ascending order from upstream to downstream of the river. Retention of microplastics was observed mainly at the area closer to the river mouth. Secondary microplastics which include fibers, fragments, film and foams were predominately recorded in all the sampling sites. Fibers were dominant microplastics category that accounted as 63%, 58% in surface waters and 46%, 49% in sediment. Polyethylene, polypropylene, polyvinylchloride and polystyrene were the polymer types detected by the Raman spectroscopy. Further studies are needed to understand the major pathways of MP pollution in the river.

**Keywords:** *Attanagalla River, Microplastics, Sediment, Surface water*