# MICROPLASTICS IN STREAM WATER AND SEDIMENTS OF RAWAN-OYA TRIBUTARY OF MAHAWELI RIVER IN KANDY DISTRICT

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Microplastic contamination has become a global environmental problem in freshwater systems. This study determined the presence of microplastics along the Rawan-Oya tributary of the Mahaweli River. Water and sediment samples were collected from four sites along an urban-rural gradient (catchment, rural, urban and semi-urban areas) from October 2019 to February 2020. A total of 640 L (80 L × 8 samples per sampling time) of surface water from each site was sieved through a 0.1 mm mesh using a steel bucket, and the residues collected on the sieve were transferred into glass jars ($n = 32$). Sediment samples ($n = 32$) were collected from the river bank, and microplastics separated using density separation with a 1 M NaCl solution. Sieved residues (0.1–5 mm) were subjected to wet peroxide oxidation using aqueous Fe(II) (0.05 M) and hydrogen peroxide (30%), below 75 ºC. Density separation was performed using NaCl, and microplastics extracted on to a membrane filter (0.45 µm) were enumerated using a dissecting microscope. Fourier transform infrared spectroscopy was used to identify polymer types. Generalized linear model with a negative binomial distribution was used to determine whether the density of microplastics varied by site for water and sediment separately. Pairwise comparisons were used to determine differences along the urban-rural gradient. Both tests showed significant differences in density of microplastics among sites ($p < 0.001$). In water, significant pairwise differences were seen between all such comparisons with a single exception between rural and semi-urban areas. In sediment, pairwise differences were seen between the catchment and all other sites. The majority of microplastics were microfibers (53.5%), while there were 31.4% microfilms, 14.9% microparticles and 0.1% microfoams. Of the 10 types of polymers identified, resin-dispersion (30%) polychloroprene (17%) and polyethylene (17%) were notable. The results provide baseline information on the presence of microplastic contamination along the stream.

**Keywords:** Freshwater, Microplastics, Rawan-Oya, Sediments