

PRELIMINARY OBSERVATION OF MICROPLASTICS IN DRINKING WATER FROM TREATMENT PLANTS IN KANDY: COMPARISON OF RAW AND TREATED WATER

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Microplastics are increasingly infiltrating ecosystems, locally and globally, amplifying concerns about their presence in drinking water. This study aimed to quantify microplastics in raw and treated water from five water treatment facilities in the Kandy District. Raw and treated water samples were collected over six months, from September 2023 to March 2024, from five water treatment plants supplying drinking water from the Mahaweli River. The five locations from upstream to downstream are Meewatura, Getambe, Gohagoda, Polgolla, and Haragama. Eighty litres of raw and treated water were sieved on-site through a 45 µm steel mesh. The residue was then collected and subjected to wet peroxide oxidation to digest organic detritus. This was followed by density separation using a saturated NaCl solution and vacuum filtration onto a membrane filter. Visual examination at 40× magnification with stereomicroscopy characterised the residual membrane filter-bound microplastics. Microplastics were present in raw (mean ± standard error; 20.5 ± 1.8) and treated water (31.7 ± 2.9). There was a significant effect of purification (generalised linear mixed model, $p = 0.0001$) and an interaction between purification and the location of the treatment plant ($p = 0.01$). The number of microplastics was higher in treated water and upstream treatment plants when compared with raw water and downstream plants, respectively. All microplastics were fibrous structures, ranging from 23.7 to 2,959.5 µm in length. There were no differences in lengths of microfibrils between raw and treated water or between locations of treatment plants (Mixed Effect Model, $p > 0.05$). These findings show the persistent presence of microplastics even in treated water. As microplastics are potentially hazardous to human health, it is necessary to determine their sources to reduce their occurrence in drinking water.

Keywords: Mahaweli river, Microfibrils, Plastic pollution, Potable water