

MICROPLASTICS IN COMMERCIALY BOTTLED WATER IN SRI LANKA

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Microplastics (MPs) are micro-sized plastic particles (< 5 mm) which have been detected in freshwater systems and in drinking water over the globe. MPs are conveyed through air and rainwater, contaminating natural water sources. This study quantified MPs in commercially bottled water in Sri Lanka. Bottled water was purchased from the market, and the samples were filtered through a 0.45 µm membrane filter to isolate MPs. The membrane filter was examined and enumerated under the Stemi508-ZEISS dissecting microscope at 40× magnification. The MPs were classified according to their colour, form, and shape. Confirmation of detected particles as MPs and identification of polymer type was performed using FTIR-spectroscopy. A Generalized Linear Model (GLM) with a negative binomial distribution was used to determine whether the concentration of MPs varied by the brand of bottled water. The major water source of bottled water was tube wells, followed by dug wells and spring water. All the bottles (n = 35) had MPs ranging from 3 - 19 MPs/l. The sizes ranged from 5 - 5,000 µm. Most MPs were present in the form of fibres (81%), followed by films (10%) and fragments (8%). Half of the MPs were transparent. Twelve types of polymers were identified, of which polyvinyl-alcohol, polyacrylamide, polyethylene and polyethylene-terephthalate were the most abundant. Brands, where the water sources were dug wells, contained a higher abundance of MPs compared to tube wells (GLM; $z = -3.06$, $p = 0.002$) and spring water (GLM; $z = -3.18$, $p = 0.001$). Further, it is likely that bottled water is contaminated with MPs during the manufacturing process. Our study stresses the importance of further investigation of MP contamination of bottled water due to its potential health risks.

Financial assistance from the National Science Foundation of Sri Lanka (Grant No. NSF/SCH/2019/04) is acknowledged.

Keywords: Bottled drinking water, Dug well water, FTIR, Microplastic, Spring water