

## Enumeration of microplastics in Sri Lankan waters: Preliminary findings from the RV Dr. Fridtjof Nansen Ecosystem Survey, 2018

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Over the past decades, plastics, as a marine litter have become an emerging issue across the world. Plastics have been used without proper recycling, but with a dramatic increase in production where plastic wastes often end-up into oceans. Plastics fold into several categories with numerous physicochemical properties which determine their fate and impact. Micro-plastics (size <5.0 mm) are generated from various sources, and are the most perilous due to their buoyancy, dispersion, and persistence. Microplastics can cause issues due to their ubiquity, bio-availability and transportability of toxins. This study assessed microplastics in Sri Lankan waters during the Ecosystem Survey (June-July, 2018), conducted onboard RV Dr. Fridtjof Nansen. The sea surface was sampled (n=38), using a *Manta-trawl* (opening: 19×61 cm<sup>2</sup>; mesh: 333 μm), hauled horizontally (~1.5 ms<sup>-1</sup>; 15 minutes) with flow-meter readings. The samples were cleansed over a sieve (180 μm) and, particles were examined under a stereo-microscope, photographed, measured and described. Samples were examined against controls (sea water & fresh water), whereas against known contaminants accumulates in the control samples to reduce contamination. The preliminary results reveal that waters in the West coast are more polluted with microplastics compared to the East-coast, due to the highest abundance in the North West (0.85 particles/m<sup>3</sup>). The Central East is slightly more polluted (0.27 particles/m<sup>3</sup>), compared to the North East (0.18 particles/m<sup>3</sup>) and the South East (0.25 particles/m<sup>3</sup>). Microplastics found in the Southern waters were low as 0.12 particles/m<sup>3</sup>. The overall average abundance of micro-plastics in Sri Lankan waters was estimated to 0.31 particles/m<sup>3</sup> of surface water. The majority of microplastics were fragments whereas the second and the third most abundant contaminants were thread-like microplastics and foams respectively. Notably, a large

amount of fragments was recorded from the Central East and the North West. The average size of particles:  $1.23 \pm 1.18$  mm, reveals the diversity in size. Most particles were 0-0.5 mm in width, and 0-4.1 mm in length, with a few lengthy particles (>28 mm). Most particles (62.67%) had rough surfaces, hard structures, and uneven shapes (74.13%). The profusion of secondary microplastics, indicates the association of industrial applications to pollution. Since the study covered a particular season, further research is recommended on spatial/ seasonal variations and distribution patterns.

Keywords: microplastics, marine pollution, RV Dr. Fridtjof Nansen Ecosystem Survey