

## Occurrence and ingestion of microplastics by zooplankton in Kenya's marine environment: First documented evidence

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Microplastics can be ingested by marine organisms and may lead to negative impacts at the base of marine food chain. This study investigated the occurrence and composition of surface water microplastics and to provide evidence of ingestion by zooplankton. Surface seawater was collected using a stainless steel bucket and sieved directly through a 250µm mesh size stainless steel sieve, while 500 µm mesh size net was horizontally towed to collect zooplankton at eleven georeferenced stations off the Kenyan coast in February 2017 on board RV Mtafiti National Research Vessel. Microplastic particles were sorted and characterized using Optika dissecting microscope. Polymer types were identified using ALPHA Platinum Attenuated Total Reflectance - Fourier Transform Infrared (ATR-FTIR) spectroscopy. A total of 149 microplastics particles, with an average abundance of 110 particles m<sup>-3</sup> were found in the surface water. One twenty-nine (129) particles were found ingested by the zooplankton groups, in which *Chaetognatha*, *Copepoda*, *Amphipoda* and fish larvae ingested 0.46, 0.33, 0.22 and 0.16 particles individual<sup>-1</sup> respectively. Filaments dominated the surface water and ingested microplastics with 76% and 97% composition respectively. White particles were prevalent in water (51%), whereas black was the preferred colour (42%) by all the zooplankton groups. Water particles were in the range of 0.25 - 2.4 mm, while those ingested ranged between 0.01 to 1.6mm. Polypropylene (PP) was predominant in water, with low density polyethylene (LDPE) being the most ingested polymer type. The results of this study provide the first documented evidence on the occurrence, composition and ingestion of microplastics by zooplankton in Kenya's marine environment indicating that microplastics have a potential of entering the pelagic food webs and causing pollution in the study area.

Keywords: microplastics; zooplankton; Kenya; marine environment; polymer; ingestion