

PLANKTON-SIZED MICROPLASTICS QUANTIFIED FOR THE FIRST TIME IN THE CANARY ISLANDS WATERS

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The ocean is a major recipient of plastic pollution, from large to microscopic debris (microplastics – MPs < 5 mm), and the impact of plastics on marine ecosystems is an emergent area of concern. MPs are nearly ubiquitous in marine waters, and the Canary Islands archipelago, in particular, is a hotspot of plastic pollution due to the accumulation of plastic litter rafted from the North Atlantic Ocean by the southward flow of Canary Current. Until now, the concentration, composition and distribution of small fraction MPs (down to 10 µm) in the Canary Islands' coastal waters has been unknown. In October 2021, a survey onboard the sailing boat “Windfall” was conducted in the coastal waters of Lanzarote, Fuerteventura, Gran Canaria, Tenerife, and La Gomera to assess for the first time the concentration and composition of small MPs (10 µm > MPs > 500 µm). Surface seawater (1 m³) were filtered with a 10 µm steel mesh using a plastic-free pump-fed device (AAU “UFO”). The MPs were analyzed by µFTIR-Imaging spectroscopy followed by automatic MP detection. MPs were ubiquitous, but high spatial variability was observed within stations. The concentration of MPs ranged from 50 MPs m⁻³ (Lanzarote) to 1664 MPs m⁻³ (La Gomera), with a median concentration of 265 MPs m⁻³. The polymer composition was dominated by polyester (46%) and polyethylene (36%). The concentration of MPs down to 10 µm in coastal waters of the Canary Islands was the highest found in surface waters using this methodology (e.g., 2-10 times higher than Greenland or the Kattegat Sea). The dominant MP size fraction detected (90 % < 150 µm) overlaps with the prey size for plankton-feeding marine animals, raising concerns for future exposure levels of marine biota to increasing MP pollution in the coastal waters of the Canary Islands.

Key words: microplastics, plastic-free sampling pump, Canary Islands, µFTIR-Imaging.

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