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# ABSTRACT BOOK

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## First detection of microplastics in deep marine sediments from the Kveithola Trough, Barents Sea

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The distribution of microplastics (MPs) in the marine environment is a growing concern. MPs have been detected from tropical to polar waters, from shallow to deep layers of the water column. Once in the sea, abiotic (photo-degradation, hydrolysis, etc.) and biotic (biodegradation, biofouling, etc.) processes lead to changes in density and buoyancy, which facilitates MPs sinking to the seabed. So much so that ocean sediments are considered as the ultimate destination for small plastic fragments (Woodall et al., 2014). For a long time, the Arctic Regions have been considered as pristine environments and at lower risk to the treat of MPs. Plus, the remoteness and the difficulty of carrying out research in deep marine environments, has lead to a scarcity of available data on MPs occurrence and distribution (Tirelli et al., 2020).

In this study, sediments from the Kveithola Trough, a trough engraved on the margin of the Barents Sea bank, were analyzed for the occurrence of MPs for the first time. Our aims were to understand if such area is affected by MPs and to have a first insight of how oceanographic currents may act on the transport of MPs.

The upper 0 - 5 cm of sediment cores were analyzed from two sampling sites: PS99-1/05-2 (74° 50.56' N, 17° 38.27' E, 295 m) and PS99-1/06-4 (74° 50.75' N, 18° 10.55' E, 336 m) (Lucchi et al., 2016). MPs were extracted from sediments using a high-density separation approach. Each MP was described based on its morphology under an optical microscope and the plastic polymers were chemically confirmed using  $\mu$ FT-IR (Lusher et al., 2020). Sediment grain-sizes analyses were performed with the particles and shape analyzer, CAMSIZER X2. Compared to other analyses on Arctic regions (Tirelli et al., 2020), a relatively low occurrence of MPs (0.19 MP g<sup>-1</sup> dw, n=13) was detected in the Kveithola Trough. The particles were exclusively fibres with the longest axis ranging from 800  $\mu$ m to >10,000  $\mu$ m. The polymers detected were polyamide (29%), elastane (21%), cellulosic materials and polyethylene (14%), viscose and polypropylene (1%). MPs were found along both cores and accumulation was dated between 1998 and 2014 for site PS99-1/05-2 and between 1980 and 2003 for core PS99-1/06-4.

Considering depths at which cores were sampled, the main transport agents were shallow (e.g. West Spitsbergen Current, WSC) and bottom currents (e.g. East Spitsbergen Current, ESC) in addition to the sinking of MPs driven by density increases. Due to the remoteness and the distance from inhabited areas, MPs could derive from the degradation of fishery gears, boat coatings, oil and gas offshore industries or maybe were driven since long distances by strong oceanic currents (Lusher et al., 2015). Further analyses are needed to better understand the distribution and the source of MPs in this trough, additionally older sediments layers must be analyzed to define the effective vertical distribution of MPs.

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