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Microplastic and microfibre pollution in Greenland: a preliminary study

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Abstract

Microplastics (MPs) and microfibres (MFs) contaminate the environment worldwide. However, MP pollution is less studied in remote and extreme environments and MF monitoring is at early stage. Atmospheric currents are one of the most important factors that contribute to the transport of these micropollutants, especially in remote areas, therefore, monitoring these environments is useful to understand the seriousness of the problem from an environmental point of view. Within a project of the Raw Materials Engineering group of DIATI, Politecnico di Torino and Extreme E, preliminary investigations in Greenland glaciers were done to understand MP and MF pollution. Samples were collected in different areas, along a track crossed by members of Extreme E during the electric off-road racing series' visit to the region. Collected samples were pre-treated with HO and filtered. Particles on filters were counted and characterized with microscopy techniques, with and without UV light. Preliminary results indicated that MPs and MFs were present in all examined samples. Micropollutant abundances increased considering that smaller size and fibre-shape were the most present factors. Spectroscopic analyses showed different kinds of plastics and a high amount of cellulosic fibres from anthropogenic origin. However, these data could be affected by several factors, especially linked to climatic factors, such as snow fusion, seasonal variations, and weather. Therefore, other detailed analyses will be necessary. Moreover, this preliminary monitoring in extreme cold environments has highlighted different problems, especially in sampling, useful to the improvement of the methods for future analyses.

Keywords: microplastics, microfibres, greenland, pollution, ice

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