
MICROPLASTICS CONTAMINATION OF SUPRAGLACIAL DEBRIS DIFFERS AMONG GLACIERS WITH DIFFERENT ANTHROPIC PRESSURE

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Abstract

Contamination by microplastics (MPs) is a global issue involving all the ecosystems, both within densely populated and remote areas. However, to date the information on the presence and the distribution of MPs in remote, high-altitude ecosystems such as glaciers, remains incomplete and disjointed. This study aimed at investigating the occurrence, the spatial distribution and the contamination pattern of MPs within and among three glaciers suffering a different anthropic pressure. Supraglacial debris was randomly sampled from the Forni, the Cedec and the Ebenferner – Vedretta Piana glaciers (Ortles-Cevedale massif, Central Alps, Northern Italy). MPs were isolated and characterised by shape, size, and polymeric composition. The mean concentration (\pm SE; MPs/g dry weight) of MPs measured in debris from the Forni, the Cedec and the Ebenferner glaciers was 0.033 ± 0.007 , 0.025 ± 0.009 , and 0.265 ± 0.027 MPs/g, respectively. MPs abundance and contamination pattern of Ebenferner glacier debris significantly differed from those of the other glaciers because of a notable anthropic pressure due to the presence of a ski area. In addition, the contamination pattern of this glacier was dominated by MP fragments, while fibres were prevalent in debris from other glaciers. No significant spatial gradients in MPs distribution were detected along the ablation areas of the glaciers. Our results suggest that local contamination can represent the main source of MPs in glacier ecosystems experiencing high anthropic pressure, while long-range transport can be the main source of MPs for other glaciers.

Keywords: microplastic, glacier, anthropic pressure

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