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MICROPLASTIC CONTAMINATION IN SNOW FROM VAL D'AOSTA (ITALIAN WESTERN ALPS)

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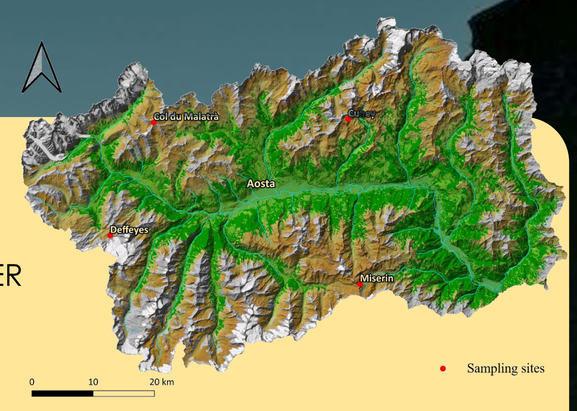
AIM OF THE STUDY

Recent studies have documented the presence of microplastics (MPs) **in remote areas**, including soils or sediments collected in mountain and glacier environments. However, the information concerning the transport routes of MPs to mountain environments is still limited. The present study aimed at exploring the presence of MPs in snow collected in four locations of the Val d'Aosta (Italian Western Alps), with different characteristics in terms of accessibility and anthropic presence.

METHODS

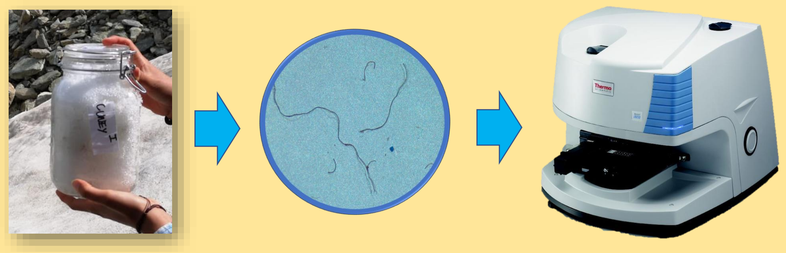
SNOW WAS COLLECTED BETWEEN 7TH AND 11TH OF SEPTEMBER 2019 OVER THE TOR DES GÉANTS® TRAIL RUNNING RACE PATH (VAL D'AOSTA, WESTERN ITALY).



Snow was sampled in four locations close to the Cuney (2,652 m a.s.l; i.e., Cuney), the Miserin (2,582 m a.s.lmicr.; i.e., Miserin) and the Deffeyes (2,500 m a.s.l.; i.e., Deffeyes) refuge, as well as at Col du Malatrà (2,936 m a.s.l.; i.e., Malatrà).

Isolation and characterization of MPs was performed according to Coppock et al., (2017), with slight modifications.

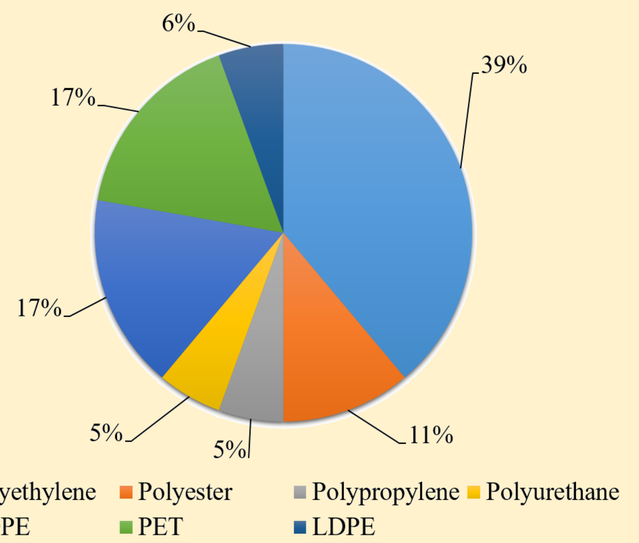
Fourier Transformed Infrared (FTIR) microscopy (μ-FTIR) was performed using a Nicolet iN10 MX Infrared Imaging Microscope (Thermo Scientific) to characterize the polymeric composition of the isolated items.



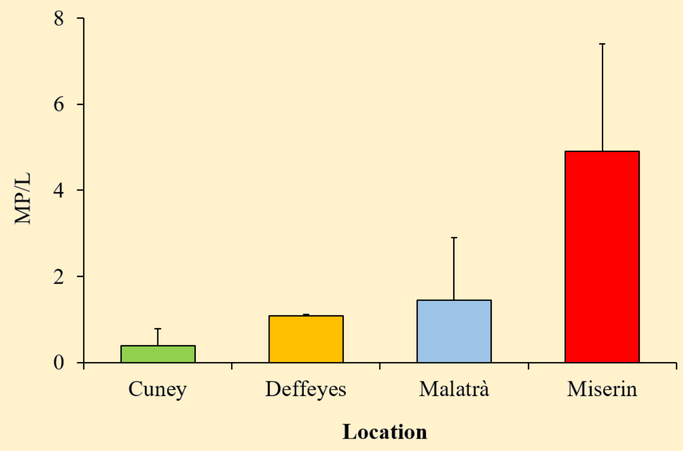
THREE SNOW SAMPLES PER LOCATION WERE COLLECTED WITH A STAINLESS STEEL SPOON AND TRANSFERRED TO 2 L GLASS JARS.

RESULTS

18 MPs (length range 50 – 1,910 μm, average length ~ 300 μm) with different polymeric composition were isolated from snow samples.



The mean (±SE) MPs abundance in snow ranged between 0.39 ± 0.39 MPs/L and 4.91 ± 2.48 MPs/L but it did not differ among locations (Kruskal-Wallis test; $\chi2 = 2.12$, d.f. = 3, p-value = 0.54).



CONCLUSIONS

The presence of MPs in high-mountain, secluded ecosystems is mediated by snow deposition, which acts as a scavenger of airborne MPs originating from local sources and/or mid - or long - range atmospheric transport.

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