

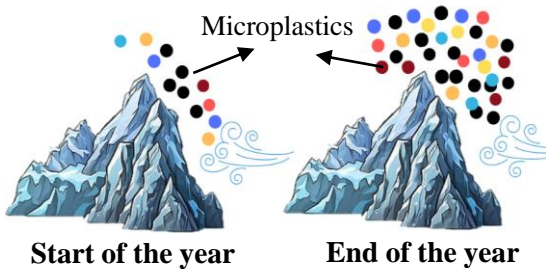
Estimation of the annual rate of microplastic accumulation in a tropical Andean glacier. Case study: Antisana Glacier

Julieth E. Chancay^{1*}, Bryan G. Valencia²

^{1,2} Universidad Regional Amazónica Ikiam, Tena, Ecuador.

* Corresponding author: julieth.chancay@est.ikiam.edu.ec

Graphical Abstract



Introduction

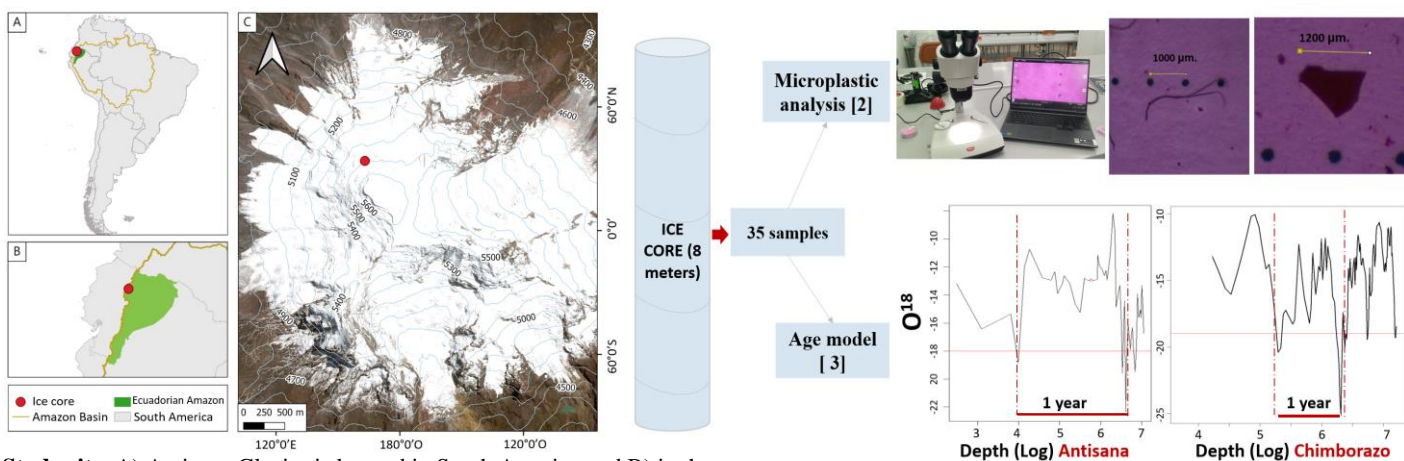
Microplastics (MPs) = plastic particles <5 mm that cause harmful effects on human health such as lung inflammation and cell death.

MPs are globally present, reaching remote areas like Andean glaciers [1] via atmospheric transport, where they accumulate in the ice.

We examine the first estimate of MPs accumulation rates in an 8-meter ice core from Antisana Volcano, Ecuador.

We identify a 12-month accumulation, highlighting the urgency of understanding MPs trends in the atmosphere.

Methodology



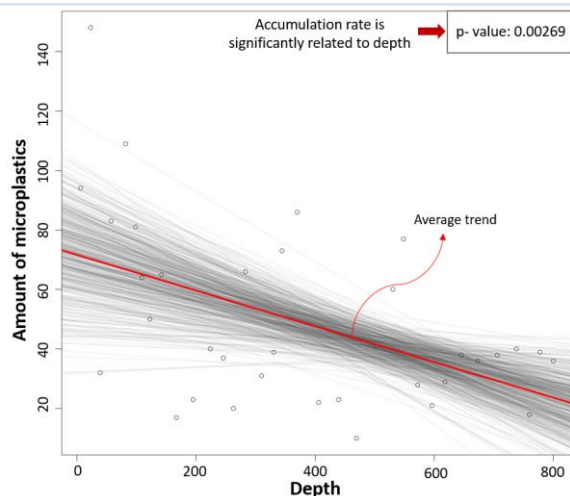
Study site. A) Antisana Glacier is located in South America and B) in the Ecuadorian Andes. C) Ice core was obtained at 5500 m.a.s.l

Results and discussion

500 simulated combinations were generated using the 35 analyzed samples. Each combination, consisting of 15 randomly selected samples, resulted in a trendline and the average trendline was computed.

The accumulation rate of MPs is estimated to increase by approximately 60% annually, reflecting a global rise in these pollutants.

The quantity of MPs increased in the shallower layers, indicating a rising trend over time, likely associated with atmospheric transport of these microplastics.



Conclusions

It was revealed that MPs exhibit an annual accumulation rate of 60%, suggesting a global increase in these pollutants, associated with atmospheric transport of MPs. Additionally, results from the Antisana glacier, near the Ecuadorian Amazon, indicate that despite the atmospheric "filtration" process due to constant precipitation, a significant presence of microplastics persists.

Bibliography

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