

Long-range transport and origin of microplastics in rime-ice observed at a remoto mountain

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In these days, the pollution of marine, freshwater and terrestrial environment with microplastics (MPs) has been focused on. However, only a few researches have reported which focused on long-range transport of atmospheric MPs. In this study, we use rime-ice to clarify the long-range transport of atmospheric MPs in free troposphere altitude of mountain site.

Atmospheric MPs were identified by Fourier transform infrared imaging in all samples. The MPs concentrations of rime-ice was ranged from 5.5 to 12.1 $\times 10^3$ N liter⁻¹. About 90% of MPs observed in rime-ice is <100 μ m and mainly polyethylene (PE). Most of them are fragment. The size of atmospheric MPs are relatively small and has the density of polymer are between 0.65 to 1.8 g/cm³ which is smaller than the soil particle (2.65 g/cm³). Gathering of the sampling site where was free troposphere, and back trajectory analysis, the MPs in rime-ice are move to 1,000 km far away.

Keywords: rime-ice, microplastic, long-range transport, free troposphere