

## Microplastic and potential harmful trace elements (PHTE) as co-pollution in high-mountain freshwater biota

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Over the last few years, plastic has been defined as a new emerging pollutant found in every habitat across the globe. Microplastics are tiny plastic particles considered as an issue of great concern due to their size, since they can interact between different ecosystem compartments and easily be incorporated into the trophic chain. Furthermore, microplastics may interact with other contaminants present in the environment, such as trace metals. Still, little is known about the mechanisms driving these interactions and the consequences that this co-pollution might pose, and as such this study therefore focuses on assessing and determining the pollutants (i.e., microplastics and trace metals) present in (relatively) pristine mountain areas, where the presence of microplastics is mainly derived from atmospheric deposition [1]. The present study aims to determine whether there is any correlation between the presence of microplastics and trace metals in different compartments of the river ecosystem. We also aim to determine the likely effects of these two groups of pollutants on river biota. Because our study sites are subjected to different impacts (current and historical), we also aim to determine the possible sources of microplastics and trace metals. For this purpose, we analyse microplastics and trace metals present in river trout (*Salmo trutta*) and other ecosystem compartments (e.g., biofilm) in the Pyrenees. The mercury concentrations up to 500+  $\mu\text{g kg}^{-1}$  w.w. measured in trouts, occasionally even exceeding EU guidelines of maximum threshold values, are clearly associated with a bioaccumulation phenomenon as demonstrated by the correlation between size,  $\delta^{15}\text{N}$  signatures and mercury concentrations [2]. On the contrary, microplastic concentrations are not associated with bioaccumulation mechanisms but rather with specific characteristics of the habitats. Finally, we will assess the risk this co-pollution may pose for other components of the trophic chain, including humans.

[1] Allen et al., (2021), Evidence of Free Tropospheric and Long-Range Transport of Microplastic at Pic Du Midi Observatory. *Nat Commun* 2021, 12 (1), 7242.