Learning from others: a framework for addressing blank issues in the study of micro and nanoplastics

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Abstract

The study of microplastics and nanoplastics has experienced a welcome boom in recent years. This interdisciplinary research is based on analytical developments in microscopy or mass spectrometry. However, the study of microplastics in living organisms, on the open ocean and in other environments far from direct sources of anthropogenic pollution, requires the avoidance of potential contamination in the field, in the laboratory and during analysis. These precautions must be at the heart of all sampling and analytical protocols as there are large orders of magnitude in microplastics concentrations between remote samples and the urban environment in which most research laboratories are located.

Building on previous trial and error experiences in geochemistry, aerology, forensics and paleo-DNA, we propose a conceptual framework for the study and exchange around blank issues in environmental microplastic studies.

Our objective is to obtain zero or the lowest possible procedural blanks. We pose the problem and attempt to solve it using a mind map approach. This mind map is located on a matrix from the problem through the field and laboratory to the analytical technique and branching from the type of plastic, its size range and possibly their by-products (monomers in the context of mass spectrometry, fragmentation, false positive in the context of microscopy etc). Finally, we assess the best model (wiki, forum, opened mind-map, mailing list...) to discuss, share and avoid unfortunate experiences with bad blanks.

Keywords: microplastics, nanoplastics, blank, field work, analytical issues

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