

# Microplastic Occurrence in Commercial Sea Salt: Sampling and Quantification Challenges

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## Introduction

Microplastic's occurrence in sea salt has becoming an issue of a public concern, due to the potential negative effects that microplastics could have on human health. Salt, in fact, could be seen as a carrier of microplastics into the organisms. However, quantification of microplastics in sea salt is still hampered by methodological limitation. In Italy, there are three important salterns, characterised by global relevance given the significant export of Italian salt to foreign countries.

## Methods

In this work, sea salts collected from Italian salterns have been investigated in terms of microplastics contamination. From a methodological point of view, salt samples were solubilised in MilliQ water and filtered to extract microplastics. Microplastics were visually quantify using a stereomicroscope. Hence, microparticles present were classified by their morphological characteristics, details like shape, size and colour. Afterwards, microparticles isolated were chemically identified using ATR-FTIR and Raman spectroscopy, to assess the polymer type.

## Results

Results showed an average of  $1653 \pm 29$  microplastics/kg of sea salt. Regarding shape, 80.6 % of microplastics have a fiber shape, 18.9 % a fragmented shape and 2.7 % are sphere. Size of microplastics ranged between 0 and 500  $\mu\text{m}$ , meaning the presence of a fraction potentially relevant from human health perspective. ATR-FTIR and Raman spectroscopy confirmed plastic nature of microparticles. Particularly, polypropylene, polyamide and polyethylene were the most abundant polymer type in samples.

## Conclusions

The present work confirmed the presence of microplastics in sea salt samples, with a fraction of “small” microplastics, which could represent a threat to humans. Further investigation are required to in-depth assess the contamination levels of microplastic sin the food chain as well as their impact on humans.