

AGRIFOODPLAST

INTERNATIONAL CONFERENCE ON MICRO AND
NANO-PLASTICS IN THE AGRI-FOOD CHAIN

ABSTRACT TEMPLATE

Preferred presentation type (oral/poster):

Oral

Session:

Session 1: fate and modelling of micro- and nanoplastics in terrestrial environments

Title:

Optimization of pyrolysis-gas chromatography/mass spectroscopy parameters in order to obtain nanoplastics calibration curves

Authors and affiliations:

Chiara Gnoffo¹, Alberto Frache¹, Hannah Forsyth², Moritz Bigalke²

¹ Politecnico di Torino, Dept. of Applied Science and Technology, Viale T. Michel 5, 15121, Alessandria, Italy

² Technische Universität Darmstadt, Dept. of Soil Mineralogy and Soil Chemistry, Schnittspahnstraße 9, 64287, Darmstadt, Germany

Presenting author:

Chiara Gnoffo

Abstract:

The issue of plastic pollution is one of the challenges of the coming years. When it comes to agriculture, this material is widely used, although its degradation leads to formation of micro- and nanoplastics, whose impact is being studied within the Minagris project. In particular, the identification and quantification of nanoplastics in soil can be challenging due to their size, which is below the special resolution of several techniques typically used for the characterization, as Raman or μ -FTIR analysis. Furthermore, the presence of organic matter or biological agents makes these techniques unsuitable for this purpose. Pyrolysis-gas chromatography/mass spectroscopy enables to investigate nanosized plastic samples with low limit of detection (LOD) and limit of quantification (LOQ). In this work, some of the main types of plastic used in farming have been tested at the nanoscale; with optimized parameters of py-GC/MS, calibration curves of these polymers have been obtained, in order to test out the likelihood of analysing them not only qualitatively, but also quantitatively. Strong linear correlation has been found between the peak areas of the markers of each polymer and its quantity under analysis, an outcome that may be useful for real nanoplastic samples.

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