DETECTION OF MICROPLASTICS IN MARINE SEDIMENTS: RESULTS FROM THREE ITALIAN COASTS

INTERNATIONAL CONFERENCE ON MICROPLASTIC POLLUTION IN THE MEDITERRANEAN SEA

µMED Conference – III edition
Naples, Italy
25 – 28 September 2022
Partenope Congress Centre

BOOK of ABSTRACTS

DETECTION OF MICROPLASTICS IN MARINE SEDIMENTS: RESULTS FROM THREE ITALIAN COASTS

Valentina BALESTRA, Federica TRUNFIO, Cassandra CAIONE, Evgenia TSIMBLIUK, Paola MARINI, Rossana BELLOPEDE*

Department of Environment, Land and Infrastructure Engineering (DIATI), Politecnico di Torino, Corso Duca degli Abruzzi, 24 10129 Torino, Italy)

*rossana.bellopede@polito.it

The presence and dangerousness of microplastics (MPs) in aquatic environments is universally recognized. The MPs criticalities are tied to their small size (less than 5mm), which make most of the treatment processes used for other waste ineffective, to their persistence and poor degradability and to their presence in large and ever-increasing quantities.
This research deals with the separation and identification of MP particles present within sediments of sea sand sampled in three different Italian coasts: Imperia (Liguria), Metaponto (Basilicata) and Villa San Giovanni, (Calabria). Comparison between sediment sampled from less frequented beaches and tourist ones were made too, to verify the relation with tourism or any other sources of MP pollution. The complexity of collecting and analyzing real sample, the proper counting and recognition of all MPs in the sample were deeply discussed.
The importance of grain size classification and separation was highlighted [1]. The density separation method with saline solution (NaCl) was used to analyze the samples. In addition, a $CaCl_2$ solution was tested to separate MP particles with higher density. Electrostatic separation method was tested too, separating the conductive fraction to the non-conductive (containing MPs) one. An increasing of MP content/g of sediment was obtained comparing the non-conductive fraction with samples subjected to densimetric separation with NaCl solution (reaching also a 82% of variation). This method could be used to reduce the volume of samples, optimizing the MP identification and counting; however, other tests could be carried out in the future taking into account that a loss of material due to the apparatus should be considered. Visual identification under microscope with a UV lamp was used to identify and count fluorescent MPs particles [2][3], subsequently verified with spectroscopy analyses using FTIR.

Acknowledgement: The authors wish to thanks all people helped them during the various stages.

References:
[1] C. Alomar, F. Estarellas, S. Deudero, Mar. Environ. Res. *115*, 1-16, 2016.
[2] V. Balestra, R. Bellopede, Environ. Pollut. 292, 118261, 2022.
[3] S.M. Ehlers, J. Maxein, J.H.E. Koop, Ecological Research 35, 265-273, 2020.