

# Microplastic characterisation in fluvial and marine sediments: the case of the Gulf of Tigullio (north-western Italy)

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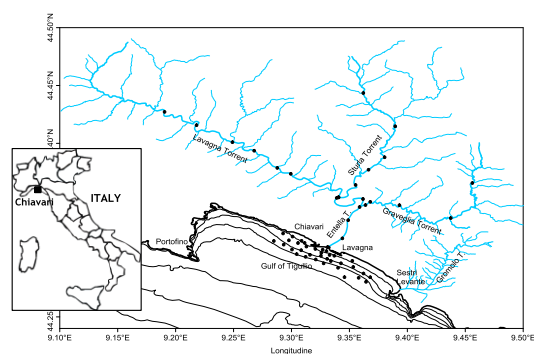
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**Introduction:** Macro and microplastics are among the most important pollutants for the global environment. Introduced in the mass production starting from 1950s, they have spread and still spread in fluvial and marine environments causing problems for fauna, such as mechanical choking, decrease ecophysiological function after ingestion, contamination for adsorption and transport of chemicals on ingested plastics [1, 2, 3].

The purpose of this study was to collect and present data on the number and composition of microplastics in the fluvial and marine sediments of the Gulf of Tigullio (north-western Italy).

**Methods:** 56 samples of 250 ml of sediments were collected in the upper layer (2 cm) of sea bottom off Chiavari and Lavagna, and torrent bed of Entella Torrent and its tributaries (Lavagna, Sturla and Graveglia Torrents; Fig. 1). In laboratory, 50 ml of sediments were mixed with 200 ml of hypersaline water solution ( $1.2 \text{ g cm}^{-3}$ ) for the density separation of microplastics from the sediments. The supernatant was collected and then filtered on cellulose acetate membranes for the visual inspection and photograph with the microscope. Microplastics were counted and separated in groups for size, type, shape and colour.



**Fig. 1:** Study area: Gulf of Tigullio (north-western Italy).

**Results:** Microplastics found in the samples showed a varying composition in terms of shape, size, colour and composition, with a great presence of fibres and spheres, especially in the torrent samples.

The results of the microplastic diffusion and characteristics are the first in the Gulf of Tigullio and

try to connect the microplastics found in the torrents to those found on the sea bottom, and the complex dynamic of currents that characterise the gulf [4].

**Discussion:** This study is part of a larger research that involves interactions between abiotic (minerals, metals and microplastics) and biotic (diatoms, fungi, marine molluscs and fishes) sector in both river and sea environments.

The results obtained in this preliminary characterisation will allow deepening the knowledge on the microplastic impact on the environment.

The most common plastic polymer found in the samples will be used to perform tests on *Mytilus galloprovincialis* to evaluate the response of this organism to this kind of stress.

**References:** [1] Free et al. (2014) *Mar Pollut Bull* **85**(1):156-163; [2] Qiu et al. (2015) *Environ Sci Eur* **28**:2; [3] Duis and Coors (2016) *Mar Pollut Bull* **98**:274-280; [4] Capello et al. (2016) *Mar Pollut Bull* **109**:128-141.