Title: **Metabolomics effects of microplastics on filtering organisms**

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It is known that microplastic (MPL) litter causes negative effects on the environment and human health. Plastic particles enter in the marine food web and produce different adverse effects, among them can produce alterations on the metabolism of marine wildlife, and eventually reaching the human trophic chain.

Despite the research carried out during the last years, nowadays continue to be needed assessing the bioaccumulation of plastic particles in the aquatic biota according to their composition and size, their ability to be translocated to different tissues and to study their potential to produce sub-acute toxicological effects under realistic scenarios of exposure to establish the basis of realistic risk assessment.

This TFG was carried out within the PLAS-MED project devoted to the investigation of MPLs in the Mediterranean coast. This work was initially focused on the study of the metabolomics changes that can be produced on Mediterranean mussel (*Mytilus galloprovincialis)* exposed under controlled conditions to polyethylene (PE) MPLs with the antibacterial agent, triclosan (TCS), adsorbed onto their surface. The metabolomics response would be evaluated by comparing metabolomics profiles of exposed and non-exposed mussels from the Ebro Delta, analysed by high performance liquid chromatography coupled to high resolution mass spectrometry (HPLC-HRMS). This study was planned to assess two different tissues of mussels: stomachs and haemolymphs.

However, due to the health crisis by COVID-19, was impossible to finish the experiments and carry out the analysis of the samples. For this reason, this work was finalised by review of several metabolomics studies focused on the evaluation of MPLs or plastic additives effects on organisms.

The main conclusion of this study is that MPLs and related contaminants (plastic additives) induce metabolomics changes in marine organisms due to oxidative stress and changes in gene

expression, as well as other toxicological effects such as decrease of fecundity. A decrease of particle size and non-spherical shape produces an increase of toxicity. Small particle size and polymeric amorphous structure provides better sorption of other contaminants.