{rokbox title=|Graphical abstract :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-long-term-exposure-microplastic-sparus-aurata-capo-et-al-2021-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-long-term-exposure-microplastic-sparus-aurata-capo-et-al-2021.jpg{/rokbox}

X. Capó, **J.J. Company**, **C. Alomar**, **M. Compa**, A. Sureda, A. Grau, B. Hansjosten, J. López-Vázquez, J.B. Quintana, R. Rodil, **S. Deudero**
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Long-term exposure to virgin and seawater exposed microplastic enriched-diet causes liver oxidative stress and inflammation in gilthead seabream *Sparus aurata*, Linnaeus 1758.

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Abstract: Plastics accumulation in marine ecosystems has notable ecological implications due to their long persistence, potential ecotoxicity, and ability to adsorb other pollutants or act as vectors of pathogens. The present work aimed to evaluate the physiological response of the gilthead seabream (*Sparus aurata*) fed for 90 days with a diet enriched with virgin and seawater exposed low-density polyethylene microplastics (LDPE-MPs) (size between 100 and 500 μM), followed by 30 days of depuration, applying oxidative stress and inflammatory markers in liver homogenates. No effects of LDPE-MPs treatments on fish growth were observed throughout this study. A progressive increase in antioxidant enzyme activities was observed throughout the study in both treatments, although this increase was higher in the group treated with seawater exposed MPs. This increase was significantly higher in catalase (CAT), glutathione reductase (GRd), and glutathione-s-transferase (GST) in the seawater exposed MPs group, with respect to the virgin group. In contrast, no significant differences were recorded in superoxide dismutase (SOD) and glutathione peroxidase (GPx) between both groups. Exposure to MPs also caused an increase in the oxidative damage markers (malondialdehyde and carbonyls groups). Myeloperoxidase activity significantly increased because of MPs treatments. After 30 days of depuration, antioxidant, inflammatory enzyme activities and oxidative damage markers returned to values similar to those observed in the control group. In conclusion, MPs exposure induced an increase of antioxidant defences in the liver of *S. aurata*. However, these elevated antioxidant capabilities were not enough to prevent oxidative damage in the liver since, an increased oxidative damage marker was associated with MPs ingestion. The treatment with seawater exposed MPs caused a more significant antioxidant response

(CAT, GRs, and GST). Although after a depuration period of 30 days a tendency to recover the initial values of the biomarkers was observed this does not seem to be time enough for a complete normalization.

Keywords: Microplastics, Pollution, Oxidative stress, Inflammation, *Sparus aurata*