{rokbox title=|Boxplot of the biomarker activities in Sparus aurata liver :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-experimental-evidence-physiological-behavioral-effects-microplastic-ingestion-sparus-aurata-rios-et-al-2021-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-experimental-evidence-physiological-behavioral-effects-microplastic-ingestion-sparus-aurata-rios-et-al-2021.jpg{/rokbox}

Beatriz Rios-Fuster, Pablo Arechavala-Lopez, Karlos García-Marcos, **Carme Alomar**, **Montserrat Compa**
,
Elvira Álvarez
, María Micaela Julià, Antònia Solomando Martí, Antoni Sureda,
Salud Deudero
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Experimental evidence of physiological and behavioral effects of microplastic ingestion in *Sparus aurata*.
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Abstract: Increasing global research has identified microplastics (MPs) to be impacting marine organisms. The present work aimed at investigating the physiological and behavioral effects of thirty-six juvenile Sparus aurata exposed to control, virgin and weathered MPs enriched diets during a 21-day period under controlled conditions. Physiological effects were assessed in liver and brain using the following biomarkers: activities of the antioxidant enzymes catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx) and glutathione reductase (GRd), the detoxifying enzyme glutathione S-transferase (GST) and malondialdehyde (MDA) as indicative of lipid peroxidation. Individuals were recorded for behavior analysis (i.e. social interactions and feeding behavior). Results revealed an increase in cellular stress from control to weathered fish groups, with the virgin group showing intermediate levels in all quantified biomarkers. Significant differences were found in the liver for all biomarkers except for MDA, suggesting that exposure time to MPs in this experiment is long enough to trigger the activation of antioxidant enzymes but not to produce cell damage by lipid peroxidation. In brain tissue samples, fish from the weathered group presented significantly higher values for CAT and SOD, highlighting its function as primary antioxidants. Regarding behavioral effects, results showed that the two MPs enriched groups were significantly bolder during social interactions and, although no significantly, tended to be more active during feeding. In conclusion, MPs which have been weathered in marine environmental conditions produces a higher physiological response than virgin MPs but also, a physiological response is variable depending on the tissue

analyzed. In addition, a short period to MP exposure seems to affect overall social and feeding behavior but, further research is needed to assess long-term effects of MP ingestion and its potential consequences on fish populations.

Keywords: Ecotoxicology, Biomarkers, Social interactions, Feeding behavior, Plastic pollution