



Abstract

Ecotoxicological Effects in Gilthead Seabream (*Sparus aurata*) Exposed to Environmentally Realistic Concentrations of Nickel Nanoparticles [†]

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[†] Presented at the IX Iberian Congress of Ichthyology, Porto, Portugal, 20–23 June 2022.

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Abstract: Metallic nanoparticles (NPs) are emerging microcontaminants that have had, in recent years, increasing use in various sectors of the economy and society. Consequently, there is an urgent need to understand the environmental health consequences of the entry of these contaminants into the aquatic compartment. The objective of this study was to evaluate the ecotoxicological effects resulting from chronic exposure (28 days) to nickel NPs (Ni-NPs) at environmentally realistic concentrations (0.05 mg/L; 0.5 mg/L; 5 mg/L), including a negative control (0.00 mg/L), in gills and liver of *Sparus aurata*. Antioxidant defense (Catalase, CAT), phase II metabolic detoxification (Glutathione S-Transferases, GSTs) enzymes, and lipid peroxidation (thiobarbituric acid reactive species, TBARS) were evaluated. Although the data showed that gills did not show significant differences in GST and CAT activities among the experimental groups, the group exposed to the highest dose (5 mg/L) showed a higher concentration of TBARS compared to the control. Regarding the liver, significant inhibition of catalase was observed for the different groups exposed to different concentrations of Ni-NPs. The assays performed suggest that the nanoparticles could promote biochemical alterations in the livers and gills of the exposed individuals, but more biomarkers of oxidative stress are needed to reveal the mechanistic pathways of Ni-NPs.

Keywords: nanoparticles; ecotoxicity; fish



Citation: Motta, E.; Correia, A.T.; Gonçalves, J.F.; Daniel, D.; Nunes, B.; Neves, J. Ecotoxicological Effects in Gilthead Seabream (*Sparus aurata*) Exposed to Environmentally Realistic Concentrations of Nickel Nanoparticles. *Biol. Life Sci. Forum* **2022**, *13*, 59. <https://doi.org/10.3390/blsf2022013059>

Academic Editor: Felipe Daros

Published: 8 June 2022

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Author Contributions: Conceptualization, A.T.C. and J.N.; Methodology, E.M., A.T.C., D.D., B.N. and J.N.; Aquarium facilities, J.F.G.; Statistical analysis, A.T.C. and E.M.; Investigation, E.M., A.T.C. and J.N.; Writing—original draft preparation, E.M.; writing—review and editing, E.M., A.T.C. and J.N.; Supervision, A.T.C. and J.N.; Funding acquisition, A.T.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the Strategic Funding UIDB/04423/2020 and UIDP/04423/2020 through Portuguese funds provided by FCT and by the project Ocean3R (NORTE-01-0145-FEDER-000064) supported by North Portugal Regional Operational Programme (NORTE 2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (ERDF).

Institutional Review Board Statement: Experiments were prior authorized by the Ethical Committee of the host institution (ORBEA/CIIMAR), including the euthanasia procedure. Furthermore, this work took into consideration the Portuguese animal welfare testing regulations (Decree-Law 113/2013).

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.