

Evaluation of the toxicity of benzophenone-3 UV filter mixture and titanium dioxide nanoparticles in *Danio rerio*

“Priority” emerging pollutants in the hydrocycle: microplastics, nanomaterial, PFAs and PPCPs

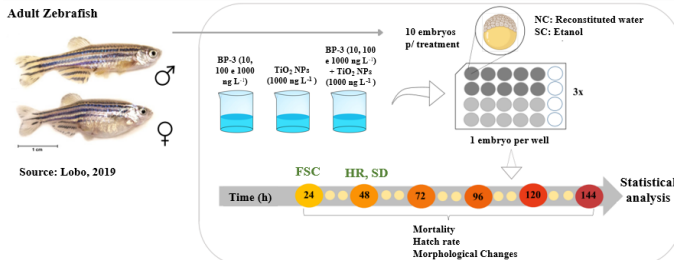
Introduction

Benzophenone-3 (BP-3) and titanium dioxide nanoparticles (TiO₂ NPs) are widely used as UV filters in personal care products to protect the skin from UV rays. However, the increasing use of these filters has raised concerns about the ecotoxicological effects of BP-3 and TiO₂ NPs, as well as the toxicity caused by the interaction between these substances in the aquatic environment. In this sense, the zebrafish (*Danio rerio*) has been an excellent model system for evaluating the toxicity of nanoparticles and emerging pollutants, as well as for the evaluation of combined toxicity.

Objective

To evaluate the embryotoxic potential of a mixture of benzophenone-3 (BP-3) and TiO₂ nanoparticles (TiO₂ NPs) in *Danio rerio* after exposure to environmentally relevant concentrations.

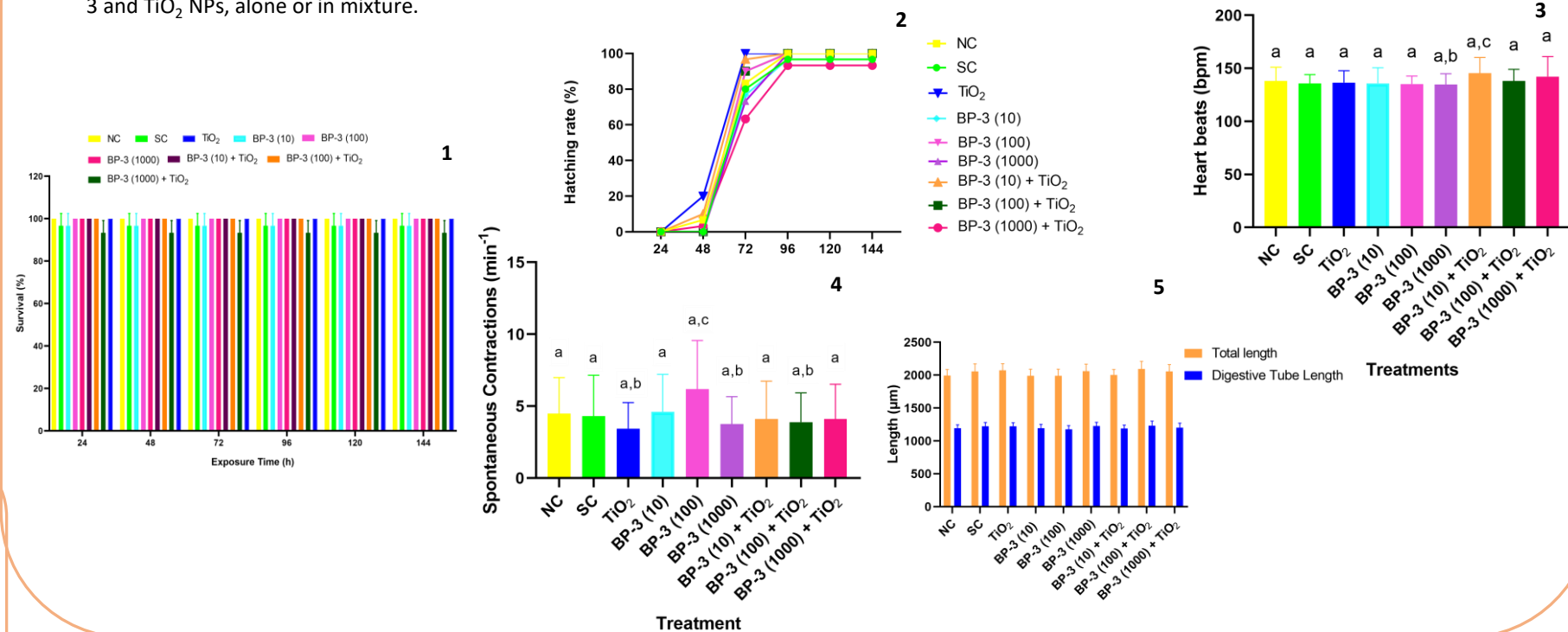
Methodology



Experimental design of the zebrafish embryo-larval toxicity test (ZELT). FSC: Frequency of spontaneous contractions; HR: heart rate; SD: stage of development.

Results

- There was no statistically significant difference in the following parameters: mortality (1), hatching rate (2), heart rate (3), spontaneous contractions (4), morphological and/or morphometric changes (5) in zebrafish embryos during 144 h of exposure to environmentally relevant concentrations of BP-3 and TiO₂ NPs, alone or in mixture.



Conclusion

- The results show the importance of sublethal biomarkers in the analysis of the ecotoxicological effects of BP-3 and TiO₂ NPs under environmentally relevant conditions, as well as the importance of using different bioindicator species.
- And they indicate the need for more studies on the interaction of the components, since they can act differently when exposed to other variables present in the environment, such as UV radiation.

Acknowledgment

