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STUDIES ON THE EFFECT OF BEACH MICROPLASTICS AND PELLETS INGESTION IN FISH WITHIN THE IMPLAMAC PROJECT

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Abstract: Marine microplastic pollution is one of the most significant environmental issues facing us today. It has been shown that microplastics (MPs) have reached all marine ecosystems and are transferred through the food chain. MPs have been found in almost all marine organisms studied, including crustaceans, jellyfish, fish, turtles, seabirds, and cetaceans. However, studying the effects of MPs and associated chemical contaminants on marine organism health is more complex and there is some controversy in the scientific literature. Furthermore, studies with environmental microplastics, which in addition to additives, concentrate chemical contaminants absorbed during their permanence in the ocean, are scarce. Given the severity of this issue, made clear by the recent spill of pellets from the Toconao ship that reached the coasts of Galicia, it is urgent to seek scientific evidence to understand the possible short, medium, and long-term effects of microplastic ingestion. This has been one of the objectives of the IMPLAMAC project, and this work summarizes the main results and conclusions reached, using European seabass (*Dicentrarchus labrax*), zebrafish (*Danio rerio*), and gilthead seabream (*Sparus aurata*) as

experimental organisms (Herrera, et al., 2022, 2023; Montero et al., 2022). To date, the main conclusions reached through the aforementioned studies are as follows:

1. Prolonged ingestion of MPs from the environment results in the transfer of additives and chemical contaminants that accumulate in the liver and can pass to the muscle tissue.
2. The presence of pellets increases the biomagnification factor of chemical contaminants present in food.
3. Pellets and chemical contaminants act synergistically to generate inflammation in the fish intestine.
4. Ingestion of MPs from the environment causes significant oxidative stress and inflammation in the liver of fish.
5. No significant effects have been observed due to microplastic ingestion on condition indices studied in fish (Fulton's index, CEA index).

Key words: Microplastics, Pellets, Chemical pollutants, Bioaccumulation, Biomarkers

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