

PROTECTING HUMAN AND ENVIRONMENTAL HEALTH FROM MICRO - AND NANOPLASTIC EXPOSURE IN A ONE HEALTH PERSPECTIVE" NANOINNOVATION 2024

MICROPLASTICS: EFFECTS ON MARINE ORGANISMS AND POTENTIAL HEALTH ISSUES

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The increase in plastic pollution poses serious risks to the environment and human health. Almost everything around us, including what we eat, includes plastic polymers. The same biodegradable materials, introduced to replace "conventional" plastics, have been recorded in environment and shown to have effects on organisms.

Our purpose is to better understand how the marine species are affected by microplastic pollution, how the microplastics enter marine trophic webs and the potential consequences on humans, in a one health prospective.

In the framework of BIOPLAST4SAFE project - "Biomonitoring of biodegradable micro and nanoplastics: from the environment to humans in a one health perspective", we study the microplastic ingestion rates in deep-sea crustaceans of high commercial importance, estimating occurrence, abundance and typology of the ingested particles. Moreover, we evaluated some stress responses in species, belonging at different taxonomic and trophic levels, exposed at biodegradable and no biodegradable plastics.

Here, we discuss the results related to: i) ingested microplastics in different edible crustacean species and ii) biological responses of bacteria, algae, rotifers and crustaceans exposed at polylactic acid (PLA) and polypropylene (PP).

Ingestion rate results showed that microplastics were detected in the gastrointestinal tract of all the species involved in the study and different species showed a preference for specific polymer, shape and colour.

Ecotoxicological results highlighted lethal and sub-lethal toxic effects of both microplastics for consumers involved in the research, but no toxicity for decomposers and primary producers.

Results point out the importance to take into consideration different trophic and taxonomic levels, as well as different life stages and feeding strategies to better evaluate toxic effects of microplastics on environment and potential implications to consumers at higher levels of the food web.

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