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Commentary

Impact of Micro Plastics on Juvenile Fishes Based Upon their Species

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DESCRIPTION

Due to their versatility, durability, and incredible adaptability, plastics have been outstanding materials in peoples' daily lives for the past century. China produced 31% of the world's total plastics production in 2019, which totaled 368 million tones with an annual growth rate of about 9%. Meanwhile, the amount of plastic garbage generated worldwide increased exponentially each year, reaching 380 Tg in 2018. Plastic that has been released into the environment may deteriorate or break down into microplastics due to UV rays, mechanical changes, or biological breakdown by microbes. Less than 5 mm in size, microplastics are bits or strands of plastic. They can be found in many different forms, including primary sources like the microbeads used in personal care products as well as secondary sources.

The United Nations environment program has included microplastics contamination as one of the top 10 growing worldwide environmental challenges since it has been widely detected in marine, freshwater, and terrestrial ecosystems. There are numerous academic publications that discuss the harmful impact of microplastics on fish. Fish are particularly prone to eating microplastics because of their alluring colour, buoyancy, and resemblance to food. Several effects can result from fish consuming microplastics: Microplastics can cause physical harm and histopathological changes; they can impair oxidative function and because inflammatory balance and intestinal microflora disorders can also change fish behaviour and they can serve as carriers to amplify the negative effects of other pollutants on fish. The ingestion, accumulation, and removal of micro plastics in fish are well acknowledged in the literatures to be species-specific, which was also supported by our prior investigations. In contrast to carnivorous species, filter-feeding and omnivore fish had higher micro plastic concentrations, according to the field survey.

Our laboratory study demonstrated that the feeding style of fish affected the amount of micro plastics fish larvae ingested, and that filter feeding fish were better able to remove micro plastics than omnivorous fish. According to a review of more than 2,000 gut content studies, an animal can eat plastic pieces that are about one-twentieth the length of its body. Three commercial fish species with various feeding habits are affected by micro plastics on a species by species basis. Because to its excellent adaptability, rapid growth, delectable favour, and high economic worth, the largemouth bass, micropterus salmoides, is a typical freshwater carnivorous fish species that is widely farmed in China. One of the most significant freshwater cultivars in China is grass carp, an herbivorous fish species, whose annual production in 2019 approached 5.53 million tones. An omnivorous freshwater fish species called the Jian carp produces 24.2 million tons of fish annually all over the world. The purpose of this study is to look into how microplastics affect the morphology and inflammatory response in fish intestines fed in various ways. The changes in the intestinal tissue of three fish after exposure to microplastics were studied using immune-related gene profiles and histopathological sections to accomplish this purpose. These findings will serve as a theoretical foundation for further investigation into the mechanism underlying the micro plastic-induced disease in fish digestive tracts.

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