

Effects of Microplastics in Aquatic Organisms and the Current Status of Microplastics Pollution in Indian Aquatic Bodies

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ABSTRACT:

The accumulation of microplastics and nanoplastics in aquatic bodies and its habitants become global-issue since last decade. Almost all the water bodies including polar regions become contaminated with plastic pollution by now. Therefore, the review mainly focused on the different effects of microplastics in fish. These particles interfere with aquatic ecology in many aspects. They disrupt the enzymatic functions among the microbes, reduce the food intake, growth and reproduction capacity among the zooplanktons. In fish, different polymers affect the behaviour, digestion, cause oxidative stress, suppress the immune genes etc. Most of the studies are on the conducted pelagic-fishes from wildcatches. In vitro studies on the effect of microplastic particles have been carried out in few selected fishes and showed the accumulations in different tissues including brain crossing the blood brain-barrier which may alter behaviour, cause various neurological problems. The review also focused on the status of microplastic pollution in Indian coastal regions, freshwaters (rivers, lakes) and freshwater indigenous fishes. The other riverine system remains untouched except River Ganga where the presence of microplastics were found in the sediment, water, and fishes. From all the reports, we found that there is a gap in the effects of microplastics in the gut associated microbes which is the primary site for accumulation. The reports on the circulatory or metabolism pathway of different polymers in fish bodies and long-term effect on the exposures are lacking. There are no reports on the colour development of ornamental fishes although reports on behavioural changes are there. Therefore, future studies may focus on gut microbes, metabolism, the effects of long-term exposure on neurological disorders and colour development as the particles get deposits in the skin of fishes.

Keywords:

Microplastics, Neurotoxic, Behavioural Disorders, Digestive and Immunological Disorders, Oxidative Stress

How to cite this article: Singh A., Ranjan S., Sati P.C., Rahul, Sharma A., and Khangembam C.D. (2024). Effects of Microplastics in Aquatic Organisms and the Current Status of Microplastics Pollution in Indian Aquatic Bodies. *Bulletin of Pure and Applied Sciences-Zoology*, 43A (1), 78-98.