

Characterization of microplastics in commercially valued Gangetic fishes and its exposure assessment on humans

ABHISHEK KUMAR AND KIRPA RAM

Banaras Hindu University

Presenting Author: abk3195@gmail.com

Microplastics (MPs) are tiny pieces of plastic that measure less than 5 millimetres in length and are becoming increasingly prevalent in our environment, including in our food. Studies have found microplastics in a variety of food items, including fishes, seafood, salt, honey, sugar, and bottled water etc (Tang et al., 2021). Freshwater and pond fishes are widely consumed as major source of animal protein in India, however, there is scarcity of research on the presence of MPs in these fishes in India (Pandey et al., 2023).

The Ganges river, one of the largest rivers in India as well as globally, is a home to diverse range of fish species and significant amount of MPs has been reported in Ganges river water and sediments (Sarkar et al., 2019). In this study, we studied the presence of MPs in the gastrointestinal tract (GIT) of 42 fish specimen of four different types of fish species in Ganges river at Varanasi. The average concentration of MPs in the GIT of all fish specimens was found to be 1 MPs per individual. The highest abundance of MPs was observed in *Seroi tengra* and *Labeo bata*, both of which had 2 MPs per individual, followed by *Johnius coitor* and *Cyprinus carpio*, both with 1 MPs per individual. The majority of the MPs (approximately 90%) were fibres and around 34% were blue in colour.

Raman analysis indicates that polytrimethylene terephthalate was the most abundant type of polymer present and accounted for ~32% of the MPs detected in these fishes. It is known that microplastics act as a vector for organic pollutants and heavy metals. Therefore, the exposure of microplastics to humans through the fish needs a detailed investigation as suggested by Gabriel et al (2020) using World Health Organization (WHO), European Food Safety Authority (EFSA) and Indian dietary recommendations of fish.

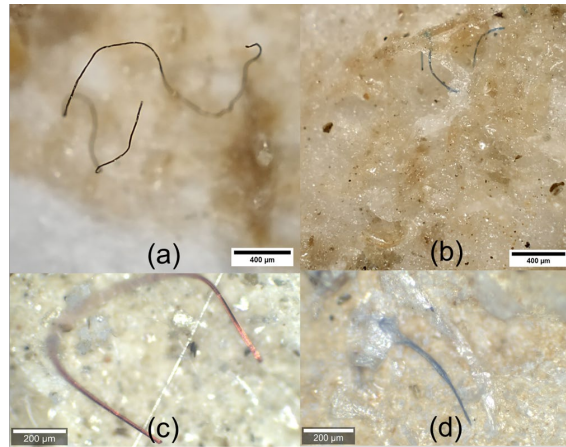


Figure.1. Photographs of microplastics present in Gangetic fishes (a-d)

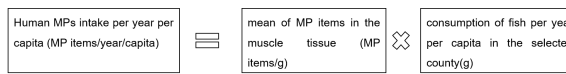


Figure.2. Formula used for human exposure to microplastics by consumption of fish (Gabriel et al., 2020)