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Microplastics in selected offshore pelagic fish in Indian Ocean

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Microplastics (MPs) pollution in marine environment is an emerging threat to marine biota. Marine pelagic fish species such as tuna and tuna-like species caught during offshore fisheries in open seas, are known to be more commercially important and could be contaminated by MPs. As such, MPs could pose a risk to fish by themselves and to human health due to consumption of contaminated seafood. The present study was planned to investigate the MPs contamination of commercially important three pelagic fish species (*Thunnus albacares*, *Katsuwonus pelamis*, and *Elagatis bipinnulata*) caught from offshore fisheries using multi-day boats from several locations of the Indian Ocean to fill the knowledge gap on MPs contamination of pelagic fish, especially in the Indian Ocean. Fish samples were collected from Beruwala, Galle, Panadura and Negombo fishery harbors in Sri Lanka, and the gastrointestinal tract (GIT) and gills were examined for possible MP contamination. A total of 40 samples belonging to three fish species were used for the study. The abundance and morphology (i.e. color, shape) of the MPs were assessed, and the polymer type of the MPs was investigated by using ATR-FTIR. Descriptive analysis was done by using IBM SPSS statistical version 26 and MS excel was used to calculate the percentages of MPs by color, shape and polymer type. There was a contamination of MPs in all three fish species. Nevertheless, 12.5% of *E. bipinnulata* and 21.7% of *K. pelamis* did not show MPs in analyzed tissues. *T. albacares* was found to have the greatest number of MPs (15±6 items individual⁻¹). The morphology of the MPs found from the GIT and gills of all the three fish species were fibers (51%), followed by fragments (37%) and films (12%). In GIT, the most prominent color was blue in all the fish species. Moreover, the polymer types found belonged to three categories *viz*, thermoplastic elastomers (TPE), phenol formaldehyde resin (PF), and polyethylene copolymer (PE-Copolymer). Among them, the most prominent type of polymer was PF. PE-copolymer was found only in *T. albacares*. Therefore, continuous monitoring of marine environment and implementing stringent regulations are recommended to minimize plastic pollution in the Indian Ocean to protect both the marine ecosystem and humans.

Keywords: Indian Ocean, Microplastics, Offshore Fisheries, Pelagic Fish

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