



MICROPLASTICS AS NON-NUTRITIVE TROPHIC ITEMS: EVIDENCE FROM FORAGING STRATEGIES IN FRESHWATER FISH

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Microplastics represent a global and emerging environmental issue in aquatic ecosystems, as they can be ingested by fish and accumulate in the gastrointestinal tract. However, studies investigating the ecological mechanisms underlying this ingestion in Neotropical freshwater systems remain scarce. In this context, this study tested the hypothesis that microplastic ingestion does not occur randomly, but is structured by species' foraging strategies, potentially acting as non-nutritive trophic items ("false trophic resources") within food webs. To address this, we evaluated the occurrence of microplastics in the fish community of the Laranjinha River, Paranapanema River basin (Paraná, Brazil), considering trophic guilds, habitat use, and seasonality. A total of 282 individuals belonging to 25 species were analyzed, of which 36.17% contained microplastics in their gastrointestinal tract. The particles were predominantly fibers (98.9%), with blue being the most frequent color (68.6%). Polymer identification revealed the presence of synthetic materials such as polyvinyl alcohol (PVA), polyacrylonitrile (PAN), and polyethylene terephthalate (PET). As predicted, microplastic ingestion varied among foraging strategies. Detritivorous species showed the highest frequency of occurrence, followed by invertivorous and insectivorous species, whereas herbivorous species showed no ingestion. These results are consistent with the hypothesis that species with lower feeding selectivity and greater interaction with sediments are more susceptible to accidental ingestion. In contrast, habitat use had no significant effect, suggesting that exposure to microplastics may be widely distributed across the system. Seasonality also influenced ingestion patterns, with higher occurrence recorded in spring. Overall, our results indicate that microplastic ingestion in freshwater fish is an ecologically structured process, reflecting foraging strategies rather than solely environmental availability. Thus, microplastics can be



interpreted as non-nutritive trophic items incorporated into food webs, with potential implications for ecosystem functioning and contaminant transfer in aquatic environments.

Keywords: *trophic guilds; feeding selectivity; Freshwater ecology; Plastic pollution*