
Microplastic consumption by fish and bivalve in Río Negro, Uruguay

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Abstract

Microplastic (MPs, plastic particles < 5 mm) pollution is a worldwide environmental problem, yet in many countries information remains scarce. Freshwater systems are recognized as pathways for these contaminants, but information about their interactions and impacts on the biota are still unclear. This work analyzed the presence and diversity of MPs in the gut contents of 4 fish species (*Corydoras paleatus*, *Iheringichthys labrosus*, *Oligosarcus oligolepis* and *Parapimelodus valenciennis*) and 1 bivalve (*Limnoperna fortunei*), present in the Río Negro river. Samples were obtained along 30 km, including 4 points between two dams (Rincón del Bonete and Baygorria) where the city of Paso de los Toros (2nd point, 3rd and 4th point downstream). Gut contents were analyzed with a modified alkaline digestion, and observed under a stereomicroscope. Particles were separated and further analyzed using microFTIR to identify polymeric compositions. Of the 53 samples analyzed, 92.5% had MPs. The most upstream point (closest to Rincón del Bonete dam) had the highest average of MPs per individual, with significant differences between sites ($p < 0.05$, ANOVA). Polymer diversity included poliester, polyethylene, polyethylene terephthalate and acrylic, aside from some mixed textiles such as cellophane and rayon. *Corydoras paleatus* was the species with the highest density of MPs per individual, with significant differences between individuals from the 2nd point, and the 3rd point (downstream) (5.25 and 2.38 respectively, $p < 0.05$ Mood's Median). However, no significant differences were found between individuals from upstream and the site in the city surroundings, both with the highest values. Bivalves showed the highest density of MPs in the most upstream point. With this study we try to further elucidate the dynamics of MPs in streams, regarding both fish and bivalves, along a variety of areas of influence.

Keywords: microplastics, fish, bivalve, ingestion, freshwater

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