Microplastic ingestion effects on feeding activity in an estuarine fish widespread in South America: Ramnogaster arcuata

Luisina Carozza Renaud*[1], Ana Carolina Ronda†[1,2], Gabriela Blasina[1,2], and Andres Arias[1,3]

[1]Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur. – Av. Alem 1253, 8000 Bahía Blanca, Argentina., Argentina

[2]Instituto Argentino de Oceanografía (IADO – CONICET/UNS). – Camino La Carrindanga km 7.5, 8000 Bahía Blanca, Argentina., Argentina

[3]Departamento de Química, Área III, Química Analítica. Universidad Nacional del Sur – Av. Alem 1253, 8000 Bahía Blanca, Argentina., Argentina

Abstract

Microplastics (MPs) ingestion studies by fishes have received increased attention over the last few years. While the number of studies documenting the presence of MPs in the gastrointestinal tract has increased, fewer studies have addressed if this ingestion is actively or passively, or if it has an effect in the feeding and general health. In the present study we evaluate the levels and types of MPs in the stomach content of *Ramnogaster arcuata* (Jenyns 1842), a small zooplanktivorous pelagic fish, in three sites with different anthropogenic pressure from the Bahia Blanca Estuary, Argentina. For that, the feeding activity was analyzed using the vacuity index (VI) and the stomach fullness index (SFI) in relation to number of MPs consumed. Results show that 100% of the specimens had MPs in their stomach and that their levels and characteristics were different between sites. Stomach contents in sites related to harbor activities presented the less MPs concentrations. Most of them were paint fragments and presented the smallest sizes and a low diversity of colors (being green and red the most abundant colors). The highest MPs concentrations in the stomach contents were found in the site near the principal sewage discharge, being mostly microfibers, followed by pellets, and with a major colors variety. The lowest SFI and the highest VI in relation to the MPs number were observed in the specimens captured near the sewage discharge. These results suggest a negative effect of MPs on *R. arcuata* feeding activity and help to elucidate part of mechanisms by which these particles enter in a bioindicator fish used in South America.

Keywords: Microplastic ingestion, Plastic pollution, Feeding activity

*Speaker

†Corresponding author: acronda@criba.edu.ar