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# Are microplastics detected in the bogue *Boops boops* (L.) reflecting those available in its coastal feeding grounds?

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### Abstract

Understanding the exposure of marine fish to microplastics (MP) has been largely addressed through the monitoring of MP extracted from gastrointestinal tract (GIT). Such studies report that MP ingestion varies considerably among species, depending on the habitats occupied and proximity to sources of pollution, but also on their feeding habits and time of the year. However, a comparison between MP ingested by fish and MP available at their feeding grounds, has seldomly been performed.

This study aims to address the highlighted gap by detecting and comparing temporal patterns in MP extracted from both seawater surface and sediment samples collected monthly (from Oct 2018 to Feb 2019), at nearshore stations along the Sado river estuary and the Professor Luiz Saldanha Marine Park, with MP ingested by wild adult fish of a commercial species (*Boops boops*) caught concurrently in the same marine area.

The percentage of fish with at least 1 MP in the GIT, among the 50 replicates collected each month, decreased from October (75%) to February (50%). The mean of extracted MP was 1.82 ± 1.37 items per fish (mean ± SD), ranging between 1 to 11 items per fish. Mean particle size was 1306.77 µm, being 44.48 µm the smallest. Although the bogue is an opportunistic omnivore, feeding on benthic and pelagic prey, the patterns verified in MP ingested by this species revealed more similarities with MP extracted from sediment samples. Besides presenting the same predominant types, namely blue fibers and filaments, the temporal fluctuations of MP abundance matched, being higher in the autumn months. This contrasts with the higher abundances verified during winter in surface samples, where fragments prevailed.

Detecting such relations for this coastal species highlights fish vulnerability to plastic pollution and their potential to be used as a proxy of the local MP pollution level.

### Keywords

microplastics, ingestion, Boops boops, temporal patterns