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# The impacts of polystyrene microparticles in the fatty acids and carbohydrate composition of the commercial bivalve species *Scrobicularia plana*

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## Abstract

Estuaries are one of the most important ecological and socio-economic ecosystems. Estuaries are hotspots of microplastic pollution. *Scrobicularia plana*, an infaunal benthic bivalve, is one of the most abundant invertebrates, with an important role in estuarine trophic food webs and is also very appreciated by humans as food source, owning a great economic value. The aim of this study was to determine the potential impacts in the fatty acid (FA) and carbohydrates (CHO) content and thus on the quality of *S. plana* exposed to increasing concentrations of polystyrene microparticules (1  $\mu\text{m}$ ; MP). We used two bivalves' size classes (small; big) and exposed to 0.00, 0.25, 2.5 and 25  $\mu\text{g/L}$  of the MP. Results show changes on FA and CHO profiles among both size classes of *S. plana* when exposed to polystyrene treatments. At the big individuals the content of saturated FA increased, and monounsaturated FA decreased with increasing MP concentration. At small organisms, monounsaturated FA increased from low to high MP concentrations. High unsaturated FA decreased from low to high MP concentrations (2.5  $\mu\text{g/L}$  and 25  $\mu\text{g/L}$  at small and big size classes respectively). The most abundant CHO was glucose for both size classes. In big size organisms, Rhamnose and Arabinose increased with increasing of polystyrene concentration. In big organisms CHO changes from control to MP treatments. In small size individuals, CHO content was similar among 0.0 to 2.5  $\mu\text{g/L}$  but increased at the highest MP concentration. Results suggest *S. plana* big size class is more affected by polystyrene microparticles with a stronger effect on CHO profile, whereas both size classes decreased in FA quality when exposed to higher polystyrene concentrations. This study highlights the effects of polystyrene in edible bivalve species and thus on human diet and health.

**Keywords:** Lipids, Carbohydrates, PUFA, Estuaries, microplastics, contamination

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