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### Land-based sources of microplastics in the Lis River, Portugal

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#### Abstract

Through time, plastic has improved our daily chores, medical supply, entertainment, etc. It seemed the perfect product however, nobody thought how to dispose of this long-lasting product and its consequences. Nowadays we struggle with plastic pollution in the ocean, a worldwide known problem that is damaging the Ecosystem, impacting the climate, our resources, and life itself.

Plastic has 2 main problems, toxic chemicals associated to production, and its constant degradation, leading to microplastic. Particles from land-based sources are transported through rivers to the sea and depending on their density can sink or drift, becoming available for ingestion by pelagic or benthic organisms. These particles can be transported amongst the food web and reach humans through diet.

Thus it's important to evaluate the sources and transportation by rivers to implement strategies to prevent and reduce.

The Lis river has more than 100 industries alongside its 37km, including plastic producers, sellers and recyclers, waste management companies, and wastewater treatment plants. Considering this location, 8 sampling sites were analyzed regarding the composition, distribution, and abundance of microplastic. Water and sediment samples were collected seasonally.

Plastic types found were fibers, filaments, pellets, fragments, films, foams and microbeads. Fibers were the most abundant type alongside the river and throughout the year. The amount of microplastic transported from the river to the sea varied with season as their polymer composition.

This work is part of a larger project where models will be implemented to describe the paths of microplastic and identify accumulation hotspots. A collaborative process will be developed in the co-construction of strategies to mitigate plastic pollution involving stakeholders in the watershed. Collection of accumulated litter from hotspots may potentially interest recyclers and means more plastic will be available for recycling, thus removing larger quantities from the ecosystem towards a circular economy.

#### Keywords

Microplastic, River transportation, Strategies, Mitigation