Plastitective: fast and efficient microplastic detection

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What is the problem?

Microplastics have been found globally and in a variety of marine organisms, water, and in humans. As of 2023, new microplastics regulations in a variety of products have begun in the US and the EU. As the presence of microplastics increases so does the concern of the impact on human health. In 2022, Okinawan fishermen raised concerns about if microplastics are present in their caught fish. The seafood industry faces a critical challenge with growing concerns about microplastics in the ocean and the presence of microplastics their products. Existing microplastic detection methods are time-consuming and lack standardization, which hinders efficient quality control and raises concerns about consumer safety and environmental sustainability.

What is your solution?

To maintain the highest safety standards in seafood products, seafood industries need a low-cost and efficient method that can automatically provide accurate results on the microplastic contamination levels in their products. Our innovative solution streamlines microplastic detection by reducing analysis time and effort requirements and ensures precise microplastic quantification, classification, and identification of microplastic across various environmental samples. Microplastics are identified via IR and Raman microspectrocopy, which provides chemical fingerprints that can be identified as plastic or non-plastic. This identification is tedious, time-consuming, and requires expert analysis to achieve. Plastitective is novel machine learning tool that will conduct high throughput microplastic identification from spectroscopic data thus providing a more standardized method for microplastic analysis.

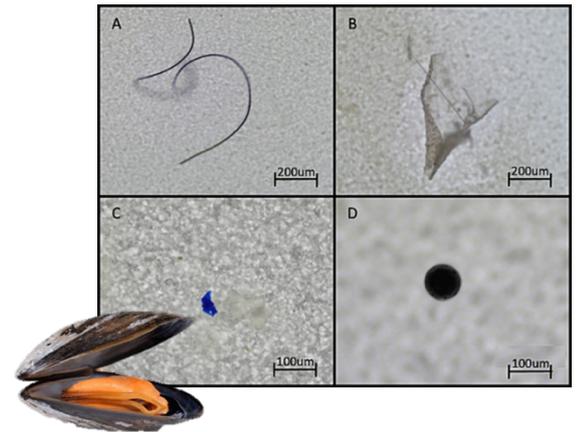**Keywords:** microplastics, chemical analysis, machine learning, plastic pollution

Figure 1. Microplastics detected in mussels.
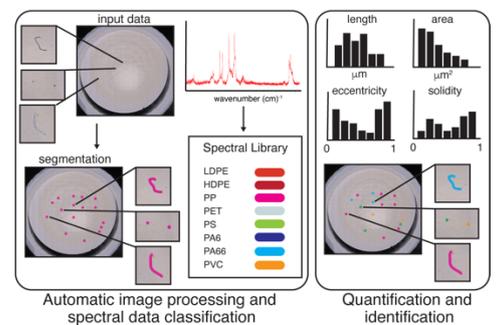Reference: *Mar. Pollut. Bull.* 196 (2023) 115609.

Figure 2. Proposed features for automatic and standardized microplastic analysis.

Other resources
- News article
- Unit website
- Google scholar

Contribution to SDGs