Reel Problems, Reel Solutions: Combatting Microplastics in Aquatic Ecosystems With Biodegradable Fishing Lures

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Soft-plastic fishing lures consistently break off from the hooks of anglers, sinking to the bottom of waterways where they degrade into microplastics over time. The goal of the project is to develop an entirely biodegradable and edible fishing lure with similar physical properties and consumer appeal to traditional plastic-lures while reducing the ecological footprint associated with fishing. With this, a new biopolymer hydrogel recipe utilizing solely sodium alginate, calcium lactate, gelatin, vegetable glycerin, cornstarch, distilled water, and natural coloring (for cosmetics) to create the biodegradable lures. Experiments on these lures were directed towards mechanical performance (breaking point and sink time), visual properties, and degradation rate for the purpose of ensuring practicality and usability. These tests found statistical similarities in degradation, visual properties, and sink time, and a statistical increase in durability for the biodegradable lures. A secondary benefit to this lure/biopolymer hydrogel is that it is entirely edible for both fish and humans. The project also addresses the potential for commercial feasibility, including cost analysis and market viability of the biodegradable lures. A large drawback of other biodegradable fishing lures on the market is their reduction in performance or their significant increase in price. A pack of 10 of our lures costs around $1.70 to produce (including biodegradable packaging and not accounting for bulk purchase of goods). As an environmentally friendly alternative to traditional plastic lures, this product reduces plastic pollution in waterways without losing traditional lure performance and monetary attractiveness for anglers.

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