

## Ingestion and accumulation of microplastics by the Blue Crab (*Callinectes sapidus*)

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Plastic is the most prevalent type of pollution found in the ocean, causing harm to marine ecosystems. By nature, plastic does not biodegrade but rather breaks into smaller fragments called microplastics which can be ingested or inhaled by various marine organisms. There are significant gaps in our understanding of the impacts of microplastics, and specifically microplastic fibers, on commercially relevant marine species, including the Blue Crab (*Callinectes sapidus*). The aim of this study was to develop a novel method for evaluating these impacts and to assess if and to what extent the Blue Crab can egest or retain PE microfibers after the ingestion of PE microfiber spiked food.

A small sample of Blue Crabs were caught in Narragansett Bay, RI, and fed oyster-gelatin dosed with various known quantities of PE microfibers over a 10-day period. Fecal samples were collected from all crabs and a subset of crabs were dissected for various tissues (digestive system, hepatopancreas, gills, and claw) post-mortem. The fecal and tissue samples were processed and analyzed for the presence of the introduced PE microfibers. Results indicate that increasing exposure of PE microfibers has a slight increase on the intake, egestion, and retention rates. The egestion of microplastics by the Blue Crab could contribute to a cyclical presence of microplastics in benthic communities and the retention of microplastics by the Blue Crab could have ecological and economic implications. Additionally, foreign microplastics (fibers and fragments) were found in fecal and tissue samples from all crabs indicating a current environmental contamination. From the tissue sample evaluation, it was discovered that the majority of both the introduced PE microfibers and the foreign microplastics were concentrated in the claw. As Blue Crab claw meat is widely consumed, the potential transfer of microplastics to humans should be considered in future studies.