Lobster digestion of microplastics could further foul the food chain

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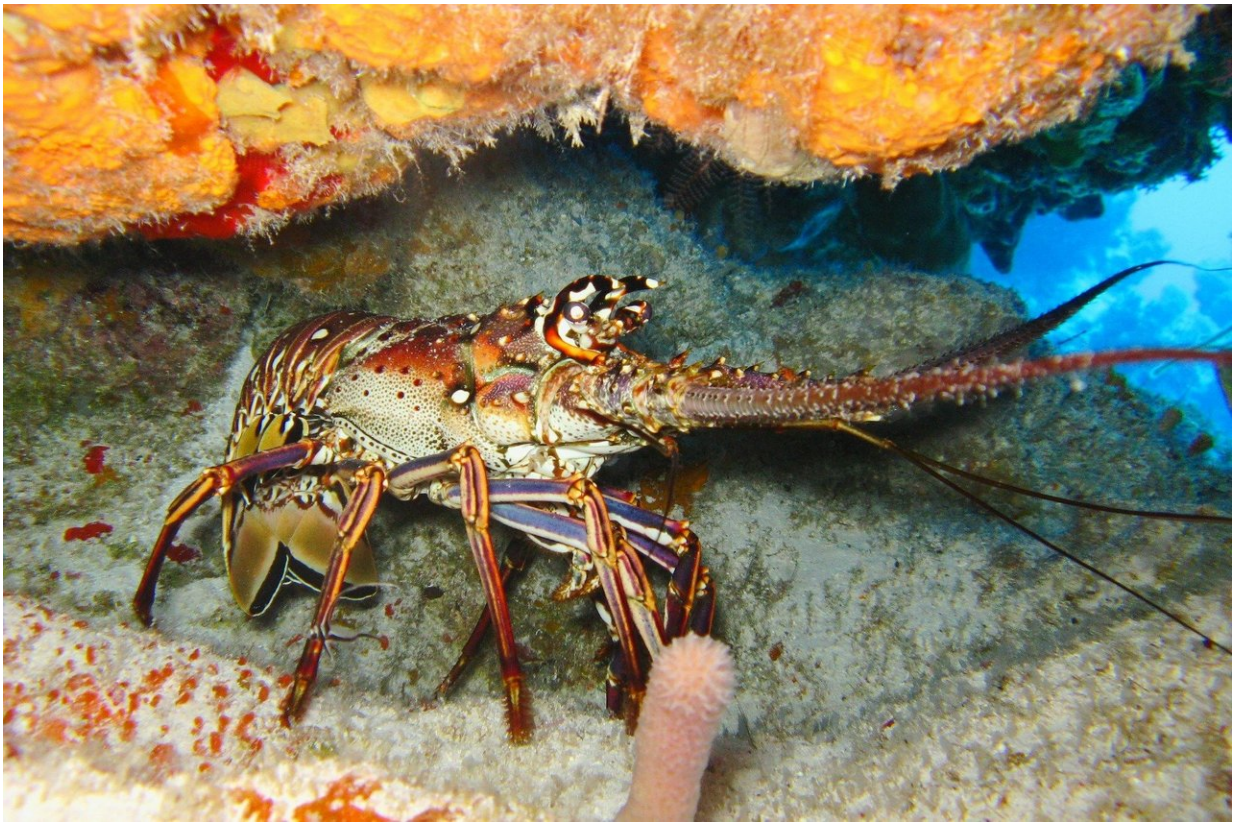

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Tiny fragments of plastic waste are dispersed throughout the environment, including the oceans, where marine organisms can ingest them. However, the subsequent fate of these microplastics in animals

that live near the bottom of the ocean isn't clear. Now, researchers report in ACS' *Environmental Science & Technology* that lobsters can eat and break down some of this microplastic material, releasing even smaller fragments into the water that other deep-sea organisms could ingest.

Microplastic pollution that makes its way into the ocean eventually sinks to the seabed. *Nephrops norvegicus*, which is also known as the Norway lobster, langoustine or scampi, lives in this region of the ocean, so it is a good indicator species for microplastic contamination of the deep sea. Prior research on the contents of stomachs or entire digestive tracts from lobsters had shown that they can ingest microplastics. And previous lab experiments had shown that a different type of crustacean that lives in the water column, rather than the seabed, can break plastic into smaller particles through digestion. Alessandro Cau and colleagues wanted to know whether this fragmentation happens in nature, and with species dwelling on the seabed.

In lobsters collected near Sardinia in the Mediterranean Sea, the researchers found that larger plastic particles became trapped in the crustaceans' stomachs. However, some particles passed into the "gastric mill," a complex of small calcified plates that grind against each other to break down food in a lobster's stomach. This process fragmented some of the plastic into smaller particles, which then moved on to the lobsters' intestines. In live animals, these smaller fragments would presumably be expelled into the ocean. These findings highlight the existence of a new kind of "secondary" microplastic, introduced into the environment by living organisms, that could represent a significant pathway of plastic degradation in the deep sea, the authors say. They also note that these tinier particles could then be more bioavailable to smaller creatures in the deep-sea food chain.

More information: Alessandro Cau et al, Benthic Crustacean Digestion Can Modulate the Environmental Fate of Microplastics in the

Deep Sea, *Environmental Science & Technology* (2020). DOI: 10.1021/acs.est.9b07705