

Plastic accumulation in food may be underestimated

July 26 2021



Credit: Unsplash/CC0 Public Domain

A new study has found plastic accumulation in foods may be underestimated. There is also concern these microplastics will carry potentially harmful bacteria such as *E. coli*, which are commonly found

in coastal waters, up the food chain.

Researchers from the University of Portsmouth tested a theory that microplastics covered in a biofilm coating (much like natural algae) were more likely to be ingested by oysters than microplastics that were completely clean. Although the experiment was carried out on oysters under laboratory conditions, scientists believe similar results could be found in other edible marine species that also filter seawater for food.

Up until now, studies to test the impacts of microplastics on [marine life](#) have typically used clean, virgin microplastics. However, this is not representative of what happens to microplastics in the [marine environment](#). Bacteria readily colonize microplastics that enter the ocean. In this study, published in *Science of the Total Environment*, scientists compared the uptake rates of clean microplastics versus microplastics with an *E.coli* biofilm coating. The results were worrying—oysters contained 10 times more microplastics when exposed to the biofilm coated beads. It is hypothesized that these coated MPs appeared to be more like food to the oysters, explaining their preferential ingestion over clean microplastics.

The scientists say the implications for the food chain are concerning. The ingestion of microplastics is not only bad for the oysters, but it affects human health too. The plastic does not break down in the marine animal and is consumed when we eat it.

Lead researcher, Dr. Joanne Preston, Reader in Marine Ecology and Evolution at the University of Portsmouth, said: "What we've discovered is that microplastic really is the Trojan Horse of the marine world. We discovered that clean plastics had little impact on the oysters' respiration and feeding rates—but did have an impact when you fed them the [microplastic](#) hidden in the biofilm. The oysters took in more and it affected their health. It is unsure exactly how much this could affect the

food chain, but the likelihood is because the creatures are ingesting more plastic and potentially, disease causing organisms, this will ultimately have a negative effect on human health. We know microplastics can be the mechanism by which bacteria are concentrated in [coastal waters](#) and this shows that they are more readily taken up by shellfish, and can be transferred to humans or other marine life."

Dr. Preston says that they "have successfully tested a hypothesis—this opens the door for more research on environmentally relevant studies of the long term impacts of biofilm coated microplastics on a wider range of marine life. We also need to study the transfer of microbes up the [food](#) chain via plastics in much greater detail."

Professor Steve Fletcher, Director of the University's Revolution Plastics initiative, says that "the findings in this research give us further insight into the potential harm microplastics are having on the [food chain](#). It demonstrates how we could be vastly underestimating the effect that microplastics currently have. It is clear that further study is urgently needed."

More information: Monica Fabra et al, The plastic Trojan horse: Biofilms increase microplastic uptake in marine filter feeders impacting microbial transfer and organism health, *Science of The Total Environment* (2021). [DOI: 10.1016/j.scitotenv.2021.149217](https://doi.org/10.1016/j.scitotenv.2021.149217)

Provided by University of Portsmouth

Citation: Plastic accumulation in food may be underestimated (2021, July 26) retrieved 20 March 2024 from <https://phys.org/news/2021-07-plastic-accumulation-food-underestimated.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.