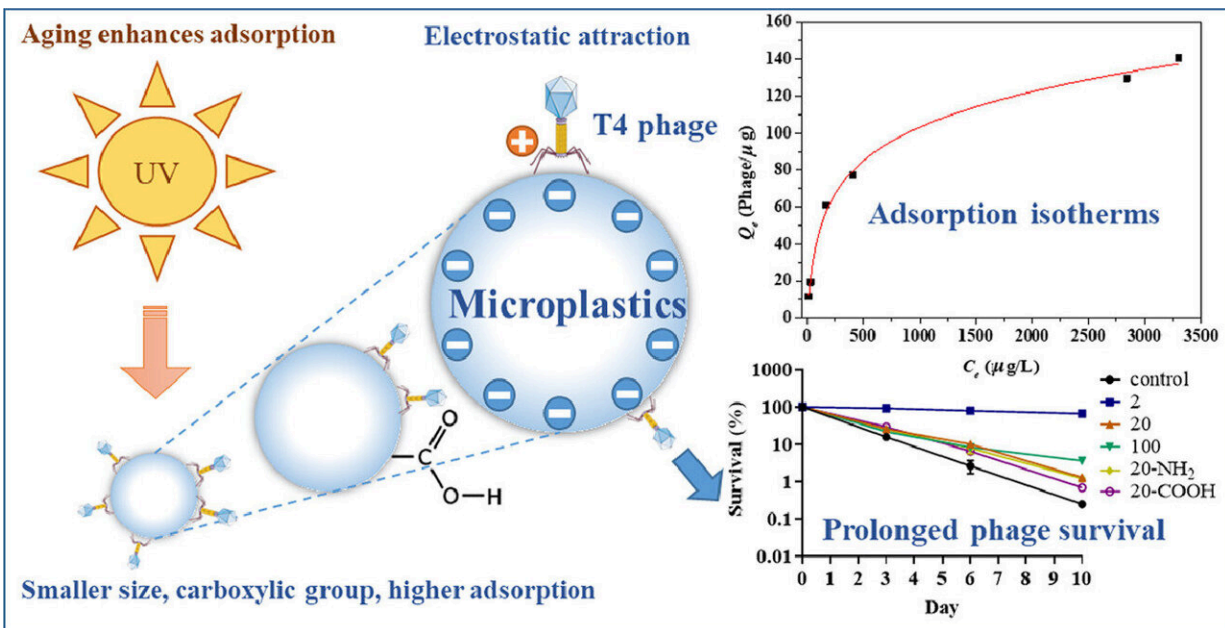


Viruses can 'hitchhike' on microplastics, study finds

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Graphical abstract. Credit: *Water Research* (2022). DOI: 10.1016/j.watres.2022.119115

Microplastics are not just tiny particles that can be ingested, they can also carry viruses, a University of Queensland study has revealed.

The study, led by Associate Prof Jianhua Guo and Dr. Ji Lu from UQ's Australian Center for Water and Environmental Biotechnology (ACWEB), investigated if microplastics have the ability to harbor

viruses, including the one found inside E. coli bacteria.

"We often hear about the human and environmental harm caused by microplastics in water, but there is little known about whether the tiny [microplastic](#) particles can carry viruses," Dr. Guo said.

"What we found is that viruses can hitchhike on microplastics and prolong their infectivity, which means there could be an increased risk of virus transmission throughout waterways and the environment."

Dr. Lu said they used the E. coli bacteriophage in the study, which is a virus that infects and replicates within the bacteria itself and is not harmful to humans.

"By testing polystyrene particles of varying sizes, we found that more than 98% of the virus we used was found on the microplastic, and over half of the viruses could still be detected 10 days later—much longer than if the [virus particles](#) were free-floating in the water," Dr. Lu said.

The team also tested how sun exposure and the size of microplastics helped prolong the virus's survival and found the more environmental damage on the microplastic, the more likely it was to carry viruses.

"The virus-carrying microplastics could be a big issue," Dr. Lu said.

"The required dosage to be infectious to humans varies between different types of viruses, but there could be instances where the dosage is enough on a microplastic to cause potential infection.

"Because microplastics can potentially accumulate deadly viruses and travel through waterways, it might be risky to eat seafoods harvested from areas where they are frequently contaminated by microplastics."

Dr. Lu said the study started when wastewater was being tested to detect COVID-19 cases in the community, which spurred the team's investigation into what could mediate virus transmission in water environments.

"Our findings also indicated that microplastics could affect how viruses are distributed in water, which could be of interest in future studies," Dr. Lu said.

"Our findings have opened the door to further research that is needed in this area, including to test if other pathogens can hitchhike on more types of microplastics.

"The fact that [viruses](#) and microplastics can interact with each other could be problematic for [human health](#), but more research needs to be conducted to investigate these impacts further."

The study is published in *Water Research*.

More information: Ji Lu et al, Microplastics as potential carriers of viruses could prolong virus survival and infectivity, *Water Research* (2022). [DOI: 10.1016/j.watres.2022.119115](https://doi.org/10.1016/j.watres.2022.119115)

Provided by University of Queensland

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