

# Harmful bacteria could be the key to breaking down plastic waste faster, scientists find

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Plastic waste is a global problem – it can choke wildlife and pollute our oceans – but researchers from Singapore may have found a new way to help get rid of it.

PhD student, Jonas Koh, and Principal Investigator, Associate Professor Cao Bin, are from Nanyang Technological University and travelled to 14 different locations around Singapore to collect plastic debris from the coast.

They found colonies of bacteria living on the waste, also known as plastisphere.

From studying the bacteria colonies, they found that the pathogens are dangerous to marine environments – but could also effectively break down the waste.

"We do see [the plastisphere as] potential plastic degraders, and that would definitely be something that we can make use of," Mr Koh said.

"[If] we can further enrich these potential helpful microorganisms that can help us to degrade plastics, then further to engineer the enzymes that they are using, then maybe we can have like a very efficient enzyme that can degrade plastics, and that could help in plastic waste management."



The research team travelled to 14 different locations to collect the data. *(Supplied: NTU)*

## **The bacterial dangers**

The plastisphere forms when plastic enters the ocean and the microorganisms attach to the surface of the matter.

A new colony of bacteria is formed, living on the plastic.

Although the bacteria could be helpful in getting rid of waste, the plastisphere is harmful to coastal ecosystems.

"There are some dangerous organisms there, dangerous in the sense they may cause diseases for the marine organisms," Professor Bin said.

According to the research, the microorganisms smell like food to many sea creatures and plants.

"Eventually they may get ingested, and then they will accumulate inside the marine organisms that cause deaths," he said.

The research team is continuing to study the way bacteria interact with marine environments to find a solution.



Plastisphere has the potential to kill marine life. *(Supplied: NTU)*

## **Catalyst for research**

The study was inspired by the lack of research into ocean plastic pollution in South-East Asia.

Professor Bin said South-East Asian countries made up six of the top 20 countries contributing to plastic waste.

"If you look at the plastic ... and the transport [of] plastics in the marine environment, we do not have much study in the South-East Asia environment," he said.

The region has very different conditions from other major waste contributors.



The bacteria found on the plastic could help speed up the process of waste degradation.  
(Supplied: NTU)

"We have high UV and high temperature throughout the year, and then we have relatively low salinity," he said.

"All these will affect the plastic and micro-interaction in the marine environment.

"That's why we think that there is a need for us to look at the plastic micro-interaction in the marine environment in the South-East Asian regions."

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