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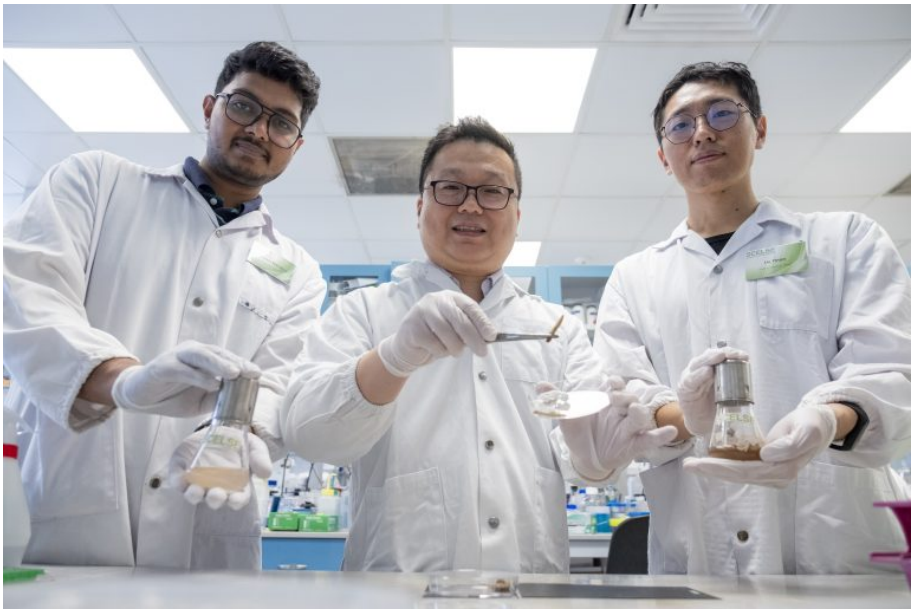
SINGAPORE SCIENTISTS TACKLE PLASTIC WASTE SOLUTION WITH 'ARTIFICIAL WORM GUT'



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Jakarta – Scientists at Nanyang Technological University, Singapore (NTU Singapore) have developed an innovative 'artificial worm gut' capable of decomposing plastics, offering a novel solution to the worldwide issue of plastic waste, the university said in a statement.

Led by experts from the School of Civil and Environmental Engineering (CEE) and the Singapore Centre for Environmental Life Sciences Engineering (SCELSE), this new technique employs microbes from worm intestines to speed up the breakdown of plastics.

Zophobas atratus worms, or 'superworms', are known for their plastic-eating abilities attributed to the bacteria in their guts. However, using these worms on a large scale has been impractical due to their slow eating habits and the difficulties in managing large populations. NTU's approach addresses these challenges by extracting and utilising the worms' gut bacteria directly, thereby bypassing the need for the worms.

Associate Professor Cao Bin from the School of CEE and a Principal Investigator at SCELSE stated, "The amount of plastic a single worm can digest over its lifetime is trivial. Our strategy enhances the plastic degradation by isolating the microbes responsible for this activity and replicating their environment artificially."

In their experimental setup, the NTU team fed superworms various plastics, such as High-density polyethylene (HDPE), Polypropylene (PP), and Polystyrene (PS). They then harvested the gut microbiomes and cultured them in an engineered setting, creating an ‘artificial worm gut’. This led to a marked increase in bacteria that degrade plastic, outperforming the results from control groups fed on a diet excluding plastics.

Published in the January edition of Environment International, Volume 183, the research demonstrates how the ‘artificial worm gut’ fosters the proliferation of bacteria adept at plastic decomposition and customises microbial populations to target specific plastic materials more effectively.

Dr Liu Yinan, the study’s leading author, emphasised their method’s effectiveness in forming bacterial communities focused on plastic breakdown. The research team is confident in the method’s potential for scalability and its ability to serve as a foundation for future advancements in managing plastic waste through biotechnology. (nsh)

Banner photo: (L-R) Members of the NTU research team include Dr Sakcham Bairoliya, Research Fellow; Associate Professor Cao Bin; and Dr Liu Yinan, Research Fellow. (Source: NTU Singapore)