

## ABSTRACT

Plastic is a fundamental polymer used in daily routine for food packaging. The use of plastic has increased since 2019 due to COVID-19 because gloves, facemasks, and sanitizer bottles are all made of plastic. All the plastic waste is ultimately disposed to sea. The plastic waste from sewerage wastewater also pollutes marine life. Microplastic and nano-plastic are hazardous for aquatic organisms. At the same time, aquatic organisms can introduce microplastic and nano-plastic pollution in humans through the food chain. In this study, we isolated bacteria from the sewerage wastewater and observed their potential to degrade plastic balloons made of polythene and nylon 6,6. Six samples were collected from sewerage wastewater, but only four samples SH2B, *Bacillus tropicus*, *Pseudomonas sp.*, and *Pseudomonas aeruginosa*, showed plastic degradation. The bacterial strains isolated from sewerage wastewater were incubated for 120 days in 50 ml of minimal salt media (MSM) containing 60mg plastic balloons. Strain SH2B showed 23%, while *Bacillus tropicus* demonstrated 21.6% weight loss of plastic. Meanwhile, a 25% weight reduction was observed by both strains *Pseudomonas sp.* and *Pseudomonas aeruginosa*. The change was observed in the size, color, and shape of the plastic pieces. FTIR analysis showed that these strains degraded the polythene by breaking the bonds. In conclusion, bacteria isolated from sewerage wastewater have potential to reduce plastic pollution from aquatic ecosystem. Future studies are required to identify genes and metabolic pathways involved in plastic degradation.

---