

ABSTRACT

Polyethylene terephthalate (PET) and polyurethane (PU) are two examples of plastics that have integrated seamlessly into our daily lives. The qualities that make plastic so well-known are its low cost, light weight, and strength. However, plastics also can harm the environment when they are no longer in use because they are difficult to break down. The microbial plastic degrading method has recently received attention due to its effectiveness and environmental safety property. They can degrade plastic by secreting enzymes that may dissolve plastic polymers. The Bantargebang landfill was selected as the study's sample collection location. To increase the diversity of isolates and the likelihood of finding prospective plastic-degrading microorganisms for PET and PU, various samples from the Bantargebang landfill will be gathered, including soil, leachate, and plastic debris. This experiment will begin with the collection of samples, cultivation of microorganisms isolated from Bantar Gebang landfills using selective media (screening 1 and screening 2), characterization of the bacterial isolates and a plastic degradation potency test (measure the percentage of plastic weight loss and Fourier transform infrared). This research has successfully isolated six bacteria colonies (3 from PET treatment and 3 from PU treatment) from the screening 2 process. The 3 isolates from PET treatment have proven to be able to degrade plastic by showing a weight decrease percentage of roughly 1%–1.6%, which was also validated with the FTIR results. Soil 2 from PET treatment appeared to have the highest weight loss percentage. However, the PU treatment resulted in a negative weight loss percentage (no decrease in weight loss percentage), although the FTIR data showed some decrease in peak intensity. As for the recommendation, a longer incubation period of at least 3 months is required to establish the potency test findings from all isolates, and further analysis such as SEM may also confirm the biodegradation activity.

Keywords: *Plastic, PET, PU, Microbial plastic degradation, Weight loss percentage, FTIR*