

Bacteria Isolation from Landfill for Production of Industrial Enzymes for Waste Degradation

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Abstract

Background/Objectives: The purpose of this study is to isolate the potential bacteria for the production of industrial enzyme cellulose and xylanase for waste degradation. **Methods/Statistical Analysis:** The bacteria were isolated from three different sources (landfill surface, 10 cm depth soil and moist soil) collected from Sungai Ikan Landfill, Kuala Terengganu, Malaysia using serial dilution and spread plate technique. Primarily screening for the enzyme production was carried out. The bacteria isolates which shows a good clearing zone diameter in ranged 2.6-8.8 cm were selected for further quantitative screening for cellulase and xylanase production by performed submerged fermentation using Carboxymethyl Cellulose (CMC) and xylan as a substrate. **Findings:** A total of 130 potential bacteria were isolated on Nutrient Agar (NA). Only 50 and 30 of the isolates exhibited cellulase and xylanase, respectively, by showing clear zone on CMC and Xylan agar plates after stained with iodine dye. From the observation of the quantitative screening of enzyme activities, B6.2 isolate exhibited the highest cellulase activity (endoglucanase 19.797 U/m Land FPase 7.384 U/mL) and M29 isolate exhibited the highest activity of xylanase (5399 U/mL). Overall, all isolates showed good cellulase and xylanase activity ranged between 0.491-19.797 U/mL and 2075-5399 U/mL, respectively. **Application/Improvements:** For future study, the enzyme produce will be used to degrade waste into fermentable sugars which used as a feedstock for bioethanol production.

Keywords: Cellulose- Degrading Bacteria, Cellulase, Landfill Soil, Xylanase, Xylan- Degrading Bacteria

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