

**ISOLATION OF XYLANOLYTIC BACTERIA FROM LANDFILL SOIL
AND PRODUCTION OF ENZYME FROM THE ISOLATE**

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ABSTRACT

Currently, all developing Asian countries facing problem related with the disposal of municipal solid waste due to the rapid economic transition and populations. Bacteria was well known for the ability to secrete the enzyme that can be used in degrading of municipal solid waste (MSW). The objectives of this study were to isolate the potential microorganism from landfill soil and the production of the xylanase from the isolate. Xylanolytic microorganisms were isolated from landfill soil while the production of xylanase was carried out in submerged fermentation. The fermentation process was performed by using xylan as substrate of carbon source under specific conditions of 37°C, 150 rpm and 72 hr of fermentation period. The number of microorganisms found in the landfill soil were 21 with different species of microorganism consisted of 15 number of gram negative and 6 number of gram positive bacteria. Among the 21 isolates, 7 isolates were xylanolytic microorganisms that able to produce xylanase. The best xylanolytic bacteria was namely C3 gave the highest xylanase activity (6.81 U/mL) during 24 hr of fermentation. As a conclusion, the xylanolytic bacteria has an ability in producing the xylanase that can be used for the degradation process of MSW.

ABSTRAK

Pada masa kini, semua negara-negara membangun di Asia menghadapi masalah yang berkaitan dengan pelupusan sisa pepejal perbandaran disebabkan oleh peralihan ekonomi yang pesat dan penambahan penduduk. Bakteria terkenal dengan kebolehan untuk merembeskan enzim yang boleh digunakan dalam menguraikan sisa pepejal perbandaran. Objektif kajian ini adalah untuk memencilkan mikroorganisma yang berpotensi dari tapak pelupusan dan penghasilan xylanase daripada pencilan. Mikroorganisma *xylanolytic* telah dipencilkan daripada tanah tapak pelupusan manakala penghasilan *xylanase* telah dijalankan menggunakan kaedah penapaian tenggelam. Proses fermentasi dilakukan dengan menggunakan xylan sebagai substrat di bawah keadaan tertentu iaitu 37°C, 150 rpm dan 72 jam untuk tempoh fermentasi. Bilangan mikroorganisma yang didapati dalam tanah tapak pelupusan adalah 21 jenis sepsis mikroorganisma terdiri daripada 15 gram negative dan 6 gram bakteria positif. Antara 21 pencilan, 7 pencilan adalah mikroorganisma *Xylanolytic* yang mampu menghasilkan *xylanase*. Pencilan yang terbaik adalah C3 dengan aktiviti *xylanase* tertinggi (6.81 U/mL) sepanjang 24 jam fermentasi. Kesimpulannya, bakteria *xylanolytic* mempunyai keupayaan dalam menghasilkan *xylanase* yang boleh digunakan untuk proses degradasi sisa pepejal.