

Intisari

ISOLASI DAN SELEKSI BAKTERI AMILOLITIK DARI TEMPAT PEMBUANGAN SAMPAH (TPS) SERTA KAITANNYA DENGAN DEGRADASI PLASTIK *BIODEGRADABLE*

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Akumulasi sampah plastik sudah sangat mengkhawatirkan terkait dengan pencemaran lingkungan, sehingga perlu dimulai penggunaan plastik *biodegradable* yang relatif lebih mudah terdegradasi. Kandungan amilum dalam plastik *biodegradable* diharapkan dapat menstimulasi aktivitas mikroorganisme pendegradasi plastik. Penelitian ini bertujuan untuk mengisolasi dan menyeleksi bakteri amilolitik dari tanah Tempat Pembuangan Sampah (TPS). Sampel tanah diambil dari daerah Piyungan (Daerah Istimewa Yogyakarta), Balikpapan (Kalimantan Timur), dan Seputih Mataram (Lampung Tengah) secara acak. Isolasi diawali dengan membuat *Enrichment culture* pada medium *Busnell Haas* cair selama 1 minggu, kemudian metode *spread* dan *pour plate* pada medium *Nutrient Agar* (NA). Isolat bakteri diseleksi berdasarkan daya amilolitik dengan metode inokulasi titik pada medium NA ditambah amilum. Isolat terpilih diuji daya degradasi plastik pada medium *Nutrient Broth* ditambah potongan plastik selama 20 hari. Isolat unggul dikonfirmasi daya degradasi plastik melalui pengamatan struktur plastik dengan *Scanning Electron Microscopy* (SEM). Hasil isolasi diperoleh 116 isolat dan hanya 75 isolat yang memiliki daya amilolitik antara 1,09–3,38. Seleksi lebih lanjut menunjukkan bahwa isolat Y4PF dan L4KB memiliki daya degradasi plastik tertinggi berturut-turut 50 dan 43,33%. Analisis SEM menunjukkan adanya perubahan struktur permukaan plastik yang diinokulasi dengan 2 isolat unggul tersebut. Hasil penelitian ini juga menunjukkan adanya korelasi positif antara aktivitas amilolitik dengan aras degradasi terhadap plastik *biodegradable*.

Kata kunci : bakteri amilolitik, Tempat Pembuangan Sampah (TPS), degradasi, plastik *biodegradable*

Abstract

**ISOLATION AND SELECTION OF AMYLOLYTIC BACTERIA FROM
WASTE DISPOSAL CENTER AND ITS CORRELATION WITH
BIODEGRADABLE PLASTIC DEGRADATION**

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The accumulation of plastic waste is very worrying associated with environmental pollution, so it needs to begin the use of biodegradable plastic that is rather easily degraded. The content of starch in biodegradable plastics is expected to stimulate the microorganisms activity to degrade the plastic. This study was aimed to isolate and select the amylolytic bacteria from the soil landfills. Soil samples were randomly taken from areas of Piyungan (Yogyakarta Special Region), Balikpapan (East Kalimantan), and Seputih Mataram (Middle Lampung). Isolation was initiated by Enrichment culture in Busnell Haas liquid medium for 1 week, then spread and pour plating on Nutrient Agar (NA). Bacterial isolates were selected based on the amylolytic capability in NA medium plus starch by point inoculation method. Selected isolates were tested for degradation of plastics in Nutrient Broth medium plus plastic pieces for 20 days. Superior isolates was confirmed through observation on plastic structures with Scanning Electron Microscopy (SEM). Isolation obtain 116 isolates where only 75 isolates having amylolytic activity between 1,09–3,38. Further selection showed that isolates of Y4PF and L4KB were superior due to capability in degrading starch as of 50 and 43,33%, respectively. SEM analysis showed changes in structure of the plastic surfaces on treatment of the 2 superior isolates. The results also showed a positive correlation between the amylolytic activity with the degradation level of biodegradable plastic.

Key words : amylolytic bacteria, waste disposal centre, degradation, biodegradable plastic