



## Intisari

### **ISOLASI DAN IDENTIFIKASI JAMUR PENDEGRADASI BIOPLASTIK BERBASIS PATI**

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Produksi dan penggunaan bioplastik berbasis pati merupakan salah satu cara untuk mengurangi akumulasi sampah plastik karena lebih mudah terdegradasi terutama oleh jamur amilolitik dan lignolitik yang diketahui mampu mendegradasi polimer bioplastik jenis ini. Penelitian dilakukan dengan tujuan untuk mengisolasi, menyeleksi serta mengidentifikasi jamur amilolitik dan lignolitik dari tanah hutan pinus, hutan mangrove, lahan pertanian dan Tempat Pembuangan Sampah (TPS) yang mampu mendegradasi bioplastik berbasis pati. Isolat dengan daya amilolitik dan lignolitik tinggi diuji kemampuan degradasinya terhadap bioplastik berbasis pati selama 30 hari dan perubahan struktur permukaan sampel bioplastik kemudian dianalisis dengan *Scanning Electron Microscopy* (SEM). Dari keempat sampel tanah terpilih diperoleh 24 isolat jamur yang terdiri dari 7 isolat jamur dengan aktivitas amilolitik saja, 5 isolat jamur dengan aktivitas lignolitik saja, 6 isolat jamur dengan aktivitas lignolitik dan amilolitik, dan 6 isolat jamur tanpa aktivitas lignolitik dan amilolitik. Seleksi isolat menghasilkan 5 isolat unggul berdasarkan nilai regresi efisiensi degradasi bioplastik yang diperoleh dari penurunan berat bioplastik selama 30 hari. Nilai regresi efisiensi degradasi bioplastik tiap perlakuan, yaitu AK-5 senilai 0,682; BK-5 senilai 0,7807; BK-6 senilai 0,7156; CK-1 senilai 0,7232 dan CK-6 senilai 0,2852. Hasil analisis SEM menunjukkan adanya kerusakan struktur permukaan plastik sebagai hasil dari proses biodegradasi isolat jamur.

Kata kunci: degradasi, bioplastik berbasis pati, jamur, amilolitik, lignolitik.



*Abstract*

**ISOLATION AND IDENTIFICATION OF  
FUNGAL DEGRADING STARCH BASED BIOPLASTIC**

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Production and use of starch based bioplastics is one of many ways to minimize accumulation of plastics waste due to its biodegradable using amylolytic and lignolytic fungi. Some of lignolytic enzymes were known important in degradation of plastic polymer and the amylolytic enzyme is able to degrade starch. The aim of the present study is to isolate and to select amylolytic and lignolytic fungi from pine forest soil, mangrove forest soil, agricultural land soil, and municipal waste dump soil that has ability to degrade starch based bioplastic and also to identify the selected fungal isolates. Fungal isolates were select by semi-quantitative amylolytic and lignolytic index. Isolates with the highest amylolytic and lignolytic index were tested by degradation assay towards starch based bioplastic for 30 days and the surface were analyzed by *Scanning Electron Microscopy* (SEM). 24 fungi isolates were isolated from selected soil sample, consists of 7 amylolytic fungi, 5 lignolytic fungi, 6 amylolytic-lignolytic fungi, and 6 non-amylolytic-lignolytic fungi. Selection of isolates resulted in 5 superior isolates based on amylolytic and lignolytic index.  $R^2$  value of each treatment are 0,682 for AK-5; 0,7807 for BK-5; 0,7156 for BK-6; 0,7232 for CK-1 and 0,2852 for CK-6. SEM analysis result shows damage in the bioplastic surface as the result of biodegradation by each fungi.

Keywords: degradation, starch based bioplastic, fungi, amylolytic, lignolytic.