

ABSTRAK

ISOLASI DAN KARAKTERISASI FUNGI TERMOFILIK PADA KOMPOS KEDALAMAN DI FASE PROSES *COMPOST PLANT* PT. *GREAT GIANT PINEAPPLE*

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PT. *Great Giant Pineapple* (GGP) merupakan salah satu perusahaan yang bergerak dalam industri pangan. Selama proses produksinya, perusahaan tersebut menghasilkan limbah dalam jumlah yang signifikan antara lain kulit buah, bonggol nanas, kotoran ternak dan bagian lain yang tidak digunakan dalam produk akhir. Upaya mengatasi permasalahan tersebut dengan mengolahnya menjadi kompos melalui proses dekomposisi yang melibatkan mikroorganisme, termasuk fungi termofilik. Fungi termofilik memiliki kemampuan termostabil dan berperan penting dalam meningkatkan laju reaksi kimia dengan mengeluarkan enzim ekstraseluler, sehingga dapat mempercepat proses pengomposan. Penelitian ini bertujuan untuk mengisolasi dan mengkarakterisasi fungi termofilik pada kompos kedalaman di fase proses *compost plant* PT. GGP yang dilaksanakan pada Desember 2024 hingga Maret 2025 di Laboratorium PT. GGP. Penelitian menggunakan metode deskriptif eksploratif yang meliputi pengambilan sampel, homogenisasi dan pengenceran berseri, isolasi, pemurnian, karakterisasi makroskopis, mikroskopis, fisiologis dan penentuan indeks enzimatik. Hasil penelitian ini diperoleh empat isolat yang terindikasi sebagai fungi termofilik. Secara makroskopis, isolat Bio DK 1, Bio DK 2, dan Bio DK 3 menunjukkan koloni berwarna hijau dengan pinggiran putih hingga abu keputihan, bertekstur halus dan tebal. Sementara itu, isolat Bio DK 4 tampak berbeda dengan warna koloni putih, bertekstur serabut halus tipis. Secara mikroskopis seluruh isolat memiliki hifa, dengan isolat Bio DK 1, 2 dan 3 memiliki konidia, sedangkan isolat Bio DK 4 memiliki sporangium. Pada uji aktivitas enzim, Bio DK 1 menunjukkan kemampuan tertinggi dalam memproduksi enzim selulase dengan indeks enzimatik sebesar 7,52, sedangkan Bio DK 4 memiliki indeks enzimatik tertinggi untuk enzim protease sebesar 3,05. Kemudian pada uji aktivitas enzim ligninase, seluruh isolat tidak dapat mendegradasi lignin.

Kata Kunci: Fungi termofilik, isolasi, karakterisasi, kompos, pengomposan.

ABSTRACT

ISOLATION AND CHARACTERIZATION OF THERMOPHILIC FUNGI IN DEPTH COMPOST AT THE COMPOST PROCESS PHASE OF PT. GREAT GIANT PINEAPPLE PLANT

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PT. Great Giant Pineapple (GGP) is one of the companies operating in the food industry. During its production process, the company generates significant amounts of waste, including fruit peels, pineapple cores, livestock manure, and other parts not used in the final product. Efforts to address this issue involve processing the waste into compost through a decomposition process involving microorganisms, including thermophilic fungi. Thermophilic fungi possess thermostable properties and play a crucial role in accelerating chemical reaction rates by releasing extracellular enzymes, thereby speeding up the composting process. This study aims to isolate and characterize thermophilic fungi in deep compost during the composting process at PT. GGP's composting plant, conducted from December 2024 to March 2025 at PT. GGP's laboratory. The study employed an exploratory descriptive method, including sampling, homogenization and serial dilution, isolation, purification, macroscopic, microscopic, and physiological characterization, and determination of enzymatic indices. The results of this study yielded four isolates indicated as thermophilic fungi. Macroscopically, isolates Bio DK 1, Bio DK 2, and Bio DK 3 exhibited green colonies with white to grayish-white edges, smooth and thick texture. Meanwhile, isolate Bio DK 4 appeared different with white colonies and a thin, smooth, fibrous texture. Microscopically, all isolates had hyphae, with isolates Bio DK 1, 2, and 3 having conidia, while isolate Bio DK 4 had sporangia. In the enzyme activity test, Bio DK 1 showed the highest ability to produce cellulase enzymes with an enzymatic index of 7.52, while Bio DK 4 had the highest enzymatic index for protease enzymes at 3.05. In the ligninase enzyme activity test, none of the isolates could degrade lignin.

Key words : Thermophilic fungi, isolation, characterization, compost, composting.