

Enzymatic Utilization of Wood-rotting Fungi in Plastic Degradation: A Biotechnology Approach to Handle Polyester-Based Plastic Waste

Alia Zahra & 'Ulayya Aimee Razlynn
SMA Semesta Bilingual Boarding School

ABSTRACT

Polyester-based plastics such as PET are difficult to decompose in the environment and are a major cause of environmental pollution that can have negative impacts on the survival of various organisms. On the other hand, Indonesia has a wealth of fungal species, including wood-rotting fungi. There are several types of wood-rotting fungi, including black rot fungi (*Fomitopsis pinicola*), white rot fungi (*Phanerochaete chrysosporium*), and brown rot fungi (*Gloeophyllum trabeum*). This study aims to test the potential of wood-rotting fungi in degrading PET through enzymatic processes and to determine the type of wood-rotting fungi that have the most potential to be PET degradation agents. The three types of fungi used were *Phanerochaete chrysosporium* (white weathering), *Fomitopsis pinicola* (black weathering), and *Gloeophyllum trabeum* (brown weathering). The research method included incubating the plastics in fungal culture media for 10 days at 37°C, followed by dry mass measurements and FTIR analysis before and after treatment. The Results showed that *Phanerochaete chrysosporium* had the highest degradation rate of 49,5%, followed by *Gloeophyllum trabeum* at 17,5% and *Fomitopsis pinicola* at 10,5%. FTIR characterization showed the breakdown of the ester chain and the formation of new compounds resulting from degradation by fungi.

Keywords: wood rot, fungi, biodegradation, mass, FTIR