THE POTENTIAL OF FUNGI ISOLATED FROM *Pleurotus ostreatus* (Oyster Mushroom) BAGLOG TO DEGRADE PLASTICS

UNDERGRADUATE THESIS

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ABSTRACT

The use of plastic Low Density Polyethylene (LDPE) has been increasing every year. Plastic is naturally realcitrant causing environmental pollution and endangers the ecosystem. Alternative strategies to reduce accumulation of plastic waste have been initiated and implemented from a different aspect including microbial point of view. These study aimed to obtain the potential fungi to degrading plastic. These studies has been conducted from October 2020 to January 2021. Experimentally using purposive sampling technique and the data obtained were analyzed descriptively. Fungi were isolated from *Pleurotus ostreatus* baglog. It was obtained two fungal isolates SP2 and SP4 based on their ability to grow on PDA and CMC media containing of LDPE sheet. Based on macroscopic and microscopic characteristics, two fungal isolate were identified as *Aspergillus niger* and *Aspergillus ochraceus*. The biodegradation test of LDPE sheets for 30 days showed the *Aspergillus niger* were able to reduce the weight of LDPE by (53%) on transparant plastic, (43%) on black plastic, and (16%) on baglog plastic. The *Aspergillus ochraceus* were able to reduce the weight of LDPE by (48%) on transparant plastic, (38%) on black plastic, and (13,5%) on baglog plastic. SEM photomicrograph of LDPE showed surface changes into rough, groove, and fungal spores sticks to LDPE surface.

Keywords: *A. niger, A.ochrceus*, Biodegradation, Fungi, Low density polyethylene, *Pleurotus ostreatus*

ABSTRAK

Penggunaan plastik Low Density Polyethylene (LDPE) semakin meningkat setiap tahunnya. Laju Degradasi plastik yang rendah menyebabkan pencemaran lingkungan dan membahayakan ekosistem. Strategi alternatif untuk mengurangi akumulasi sampah plastik telah dimulai dan diimplementasikan dari berbagai aspek termasuk sudut pandang mikroba. Penelitian ini bertujuan untuk mendapatkan jamur yang potensial untuk mendegradasi plastik. Penelitian ini dilakukan pada bulan Oktober 2020 hingga Januari 2021. Penelitian ini dilakukan secara eksperimental menggunakan teknik purposive sampling dan data yang diperoleh dianalisis secara deskriptif. Jamur diisolasi dari baglog *Pleurotus ostreatus*. Hasil yang diperoleh dalam penelitian ini adalah didapatkan dua isolat jamur SP2 dan SP4 berdasarkan kemampuannya tumbuh pada media PDA dan CMC yang mengandung lembaran LDPE. Berdasarkan sifat makroskopis dan mikroskopis, dua isolat jamur diidentifikasi sebagai *Aspergillus niger* dan *Aspergillus ochraceus*. Uji biodegradasi lembaran LDPE selama 30 hari menunjukkan *Aspergillus niger* mampu menurunkan berat LDPE sebesar (53%) pada plastik transparan, (43%) pada plastik hitam, dan (16%) pada plastik baglog. *Aspergillus ochraceus* mampu menurunkan berat LDPE sebesar (48%) pada plastik transparan, (38%) pada plastik hitam, dan (13,5%) pada plastik baglog. Fotomikrograf SEM LDPE menunjukkan perubahan permukaan menjadi kasar, berlubang, dan spora jamur menempel pada permukaan LDPE.

Kata kunci: *A. niger, A.ochrceus,* Biodegradasi, Jamur, Polietilen densitas rendah, *Pleurotus ostreatus*