

## ***ABSTRACT***

Kafiita Hanna Assyarief. 24020220140085. ***The Potential of Bacteria to Enhance Mycelial Growth and Ligninolytic Enzyme Activity in Wood-Ear Mushrooms (Auricularia sp.)***. Under the guidance of Susiana Purwantisari and Toga Pangihotan Napitupulu.

*Fungi and bacteria in various ecosystems grow alongside each other, creating communities and interactions. Interactions between these two microorganism can be either detrimental or beneficial. Beneficial bacteria that have the ability to promote fungal growth are known as Mushroom Growth Promoting Bacteria (MGPB). MGPB have been proven to enhance the growth and production of several edible mushrooms such as Agaricus bisporus and Pleurotus ostreatus. However, their application for wood-ear mushrooms (Auricularia sp.) is still limited. Given that wood ear mushrooms are as popular as other edible mushrooms in Indonesia, this study aimed to isolate bacteria that can improve the growth of wood ear mushroom mycelium from dead wood where the mushrooms grow, and to investigate the ligninolytic enzyme activity of wood ear mushrooms when supplemented with potential bacteria in vitro. Research methods included isolating bacteria from dead wood where wood-ear mushrooms grow, screening these bacteria to identify potential strains capable of enhancing fungal mycelial growth, analyzing the secondary metabolite compounds of these potential bacteria, and testing the effect of these bacteria on the ligninolytic enzyme activity of wood-ear mushrooms. The results showed that two bacterial isolates, BT8 and BN10, were able to enhance the growth of wood ear mushroom mycelium. These bacteria contained compounds such as indole acetic acid, nicotinic acid, choline, pyridoxine, pyridoxamine, and several organic acids that are beneficial for fungal growth. Enzyme activity tests revealed that the BT8 bacteria could increase lignin peroxidase activity up to 7004.18 U/g on the 21st day. Meanwhile, the BN10 bacteria increased manganese peroxidase activity up to 41.32 U/g on the 11th day and laccase enzyme activity up to 655.86 U/g also on the 11th day. The conclusion of this study is that two bacterial isolates were identified that can enhance the growth of wood ear mushroom mycelium and ligninolytic enzyme activity in vitro.*

**Keywords:** *bacterial-fungal interaction, mushroom growth promoting bacteria, edible fungi, ear-wood mushroom, ligninolytic enzyme activity*