

ABSTRACT

Zian Arikah. 24020121120037. *Optimization of the Production of α -Amylase Inhibitor Compounds and Characterization from Endophytic Fungi Mahogany (Switenia mahagoni). Biotechnology Laboratory, Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Under the supervision of Sri Pujiyanto and Dwi Retno Fatmawati.*

*Diabetes mellitus is a disease characterized by elevated blood glucose levels due to impaired insulin secretion or function. A commonly used therapy is the inhibition of the α -amylase enzyme, which plays a role in breaking down carbohydrates into glucose. The mahogany tree (Switenia mahagoni) contains bioactive antidiabetic compounds and endophytic microbes that have the potential to produce secondary metabolites. This study aims to identify the types of endophytic fungi found in mahogany plants and optimize the production of bioactive compounds that act as α -amylase enzyme inhibitors as antidiabetic agents. Endophytic fungi were isolated from mahogany leaves and stems, then identified using the book "Fungal Biodiversity" as *Aspergillus flavus*, *Aspergillus niger*, and *Acremonium sp.*, which showed the highest inhibitory activity. The production of inhibitors was optimized by treating carbon and nitrogen sources. The results showed that the optimal time for maximum inhibitor production was on the fourth day using isolate BM 1(2), namely *Acremonium sp.*, with an inhibition percentage of 94.63%. With glucose as the carbon source and peptone as the nitrogen source, the highest inhibition activity was obtained using the fermented endophytic fungal isolate method with variations in carbon and nitrogen sources. The supernatant was then tested for α -amylase inhibitory activity, resulting in a percentage of 11.05% for the carbon source and 87.32% for the nitrogen source. GC-MS analysis of metabolite extracts from *Acremonium sp.* isolates revealed the dominant compound to be D-4-Methyl Glycollate, which belongs to the ester group. This compound does not have an active group for α -amylase inhibition, so its effectiveness as an α -amylase inhibitor is relatively weak. However, the activity obtained in the optimization results shows further potential in the search for more specific active compounds.*

Keywords: *Antidiabetes, Optimization, α -amylase, Endophytes, GC-MS.*