ABSTRACT

Maulida Aziza Fianti, 24020221120003. **Molecular Identification and In Vitro Antagonism Test of *Trichoderma* sp. against *Pythium* sp. on Eggplant (*Solanum melongena* L.) Plants.** (under the guidance of Susiana Purwantisari and Wijanarka).

Damping-off and fruit rot diseases in eggplant (*Solanum melongena* L.) caused by the soilborne pathogen *Pythium* sp. cause significant crop losses. Exploration of indigenous biological control agents based on Trichoderma sp. is needed as an alternative for ecological and sustainable disease control. This study aims to characterize the morphology, identify isolates molecularly using Internal Transcribed Spacer (ITS) markers, and evaluate the effectiveness of *Trichoderma* sp. antagonism against the pathogen *Pythium* sp. in vitro. The molecular identification stages include DNA isolation, PCR amplification, Sanger sequencing, BLAST homology analysis on NCBI, and Neighbor-Joining phylogenetic tree reconstruction. The antagonism test was conducted using the dual culture method. The experimental design used a Completely Randomized Design (CRD) consisting of 3 treatments and 4 replications, namely P0 (pathogen control), P1 (pathogen inoculation 3 days before the biological agent), and P2 (pathogen and biological agent inoculation simultaneously). Data were analyzed using one-way ANOVA followed by Duncan's test ($p < 0.05$). The results of morphological characterization showed that the isolates had the typical characteristics of the *Trichoderma* genus (septate hyphae, ampulliform phialids) and *Pythium* sp. isolates (aseptate hyphae) in 7-day-old petri dish cultures. Molecular characterization results confirmed that the target isolate was the species *Trichoderma virens* (Percent Identity 99.83% and bootstrap value 88%). The results of the antagonism test showed a statistically significant difference in effectiveness between treatments. Simultaneous inoculation (P2) proved to be the most effective method with a percentage of inhibition of 78.84% (very high category), significantly different from the 3-day delayed inoculation (P1) which experienced a decrease in inhibition to 32.03% (moderate category).

Keywords: *Antibiosis, Biological Agent, Dual Culture, Internal Transcribed Spacer.*