

ABSTRACT

Marista Fikri Irsya Safina. 24020121130091. **Isolation and Selection of Chili Rhizosphere Fungi from Organic Land that are Antagonistic to Chili Damping-Off Disease.** Department of Biology, Faculty of Science and Mathematics, Diponegoro University, under the supervision of Susiana Purwantisari and Siti Nur Jannah.

Damping-off disease caused by *Fusarium* sp. is one of the main problems during the early growth phase of curly red chili (*Capsicum annuum* L.) as it reduces seedling viability and vigor. Biological control using antagonistic fungi offers an environmentally friendly alternative to suppress soil-borne pathogens. This study aimed to identify fungal species isolated from the rhizosphere of chili plants, evaluate the antagonistic ability of rhizosphere fungi against *Fusarium* sp., and assess the potential of antagonistic fungi through *seed coating* technology to enhance seed resistance against damping-off disease. The research was conducted in two stages: *in vitro* and *in planta* tests. The *in vitro* assay using the dual culture method on PDA medium was performed to determine the inhibition activity of antagonistic fungi against the pathogen, while the *in planta* assay used *seed coating* treatment with the most effective isolate. Identification results revealed five rhizosphere fungal isolates, namely *Gliocladium* sp., *Trichoderma* sp., *Aspergillus* sp. 1, *Aspergillus* sp. 2, and *Penicillium* sp.. The antagonistic test showed that all isolates inhibited *Fusarium* sp. growth at moderate to highest inhibition being *Gliocladium* sp. at 76.20%. The *in planta* test demonstrated that *seed coating* with *Gliocladium* sp. completely suppressed disease incidence (0%) with 100% control effectiveness. Therefore, *Gliocladium* sp. has great potential to be developed as a biological control agent through *seed coating* technology to enhance chili seed resistance against damping-off disease in an environmentally friendly and sustainable manner.

Keywords: antagonistic fungi, *Capsicum annuum*, *Fusarium* sp., *seed coating*.