

***Effectiveness of Pseudomonas fluorescens as an Anthracnose Control
Agent in Edamame (Glycine max (L.) Merrill)
in Vitro and In Vivo***

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ABSTRACT

Anthracnose disease caused by the pathogen Colletroticum truncatum is a major disease of edamame plants (Glycine max (L) Merrill). One environmentally friendly control alternative is the use of Pseudomonas fluorescens bacteria. This study aims to analyze the effectiveness of P. fluorescens bacteria in inhibiting the growth of the pathogen C. truncatum on edamame plants, both in vitro and in vivo. The study was conducted from June to December 2025 at the Plant and Land Protection Laboratory in Kebonsari Village, Jember. The in vitro test used a non-factorial Completely Randomized Design (CRD) with 4 levels and 5 replications of P. fluorescens concentration (10^7 , 10^8 , 10^9 CFU/ml, and control). The in vivo test was carried out on two treatments, namely P. fluorescens and 83% mancozeb fungicide. The observed variables include: Percentage of inhibition, Disease incidence, Attack intensity, Plant height, Number of productive branches, Trifoliates, Number and Weight of pods. In vitro results showed that a concentration of 10^9 CFU/ml provided the highest inhibition of 25.96% against the growth of C. truncatum. In vivo research results showed that the incidence of disease and attack intensity in the P. fluorescens treatment were 28.3% and 6.75%, while in the 83% mancozeb treatment were 27.5% and 5.28%. The number of pods in the P. fluorescens and mancozeb treatments was 34.3 and 33.0, with the same number of productive branches, namely 5 branches and the same number of trifoliates, namely 13 leaves. Meanwhile, the weight of the pods in the P. fluorescens treatment was 82.2 grams and was significantly higher than the 83% mancozeb treatment of 68.5 grams, and the plant height at 42 DAP was also significantly different. Statistically, except for pod weight, all other observed variables were not significantly different. The research results indicate that P. fluorescens has the potential to be an environmentally friendly biocontrol agent capable of increasing edamame yields, although it did not significantly suppress anthracnose disease.

Keywords: : Anthracnose, Soybean, Pseudomonas fluorescens