

Effectiveness of Bacillus subtilis Bacteria as a Biocontrol Agent for False Smut Disease (Ustilaginoidea virens) in Rice Plants

Supervisor by Trisnani Alif, S.Si., M.Sc.

Kavita Dela Agustin

Food Crop Production Technology Study Program

Department of Agricultural Production

ABSTRACT

One of the causes of low rice productivity is the attack of false smut disease caused by the fungus Ustilaginoidea virens. Efforts to inhibit false smut disease in rice plants can be made by utilizing biological control agents such as Bacillus subtilis bacteria. This study aims to analyze the ability and effectiveness of B. subtilis bacteria as a biocontrol agent in controlling false smut disease in rice plants in vitro and in vivo. This study used a non-factorial completely randomized design (CRD) with 4 treatments and 5 replicates. There were 4 in vitro treatments, namely P0 (control or without B. subtilis application); P1 (B. subtilis concentration CFU/ml); P2 (B. subtilis concentration CFU/ml); P3 (B. subtilis concentration CFU/ml), and 4 in vivo treatments, namely P0 (Control or without B. subtilis treatment); P1 (B. subtilis 10ml/l); P2 (B. subtilis 15ml/l); P3 (B. subtilis 20 ml/l). The variables observed included inhibition, disease incidence, attack intensity, plant height, number of tillers, and grain weight per sample. The observation variables were analyzed using normality and homogeneity tests using SPSS, with Kruskal-Wallis and Post Hoc Games-Howell follow-up tests. Based on the research results, it was found that the treatment had an effect. The use of B. subtilis could inhibit the growth of the U. virens pathogen in terms of inhibition rate and attack intensity by 2.49%, and disease incidence at a rate of 68.39%, while plant height, number of tillers, and grain weight showed no significant effect..

Keywords: Bacillus subtilis, Rice, Ustilaginoidea virens