INDUKSI KETAHANAN TANAMAN PADI TERHADAP WERENG BATANG COKLAT (*Nilaparvata lugens* Stal) MENGGUNAKAN CENDAWAN ENTOMOPATOGEN *Beauveria bassiana* (Bals.) Vuill.

TESIS

Oleh

YOLMA HENDRA

2120281001

Pembimbing

Prof. Dr. Ir. Trizelia, M.Si

Dr. My Syahrawati, SP, M.Si

PROGRAM STUDI PROTEKSI TANAMAN

FAKULTAS PERTANIAN

UNIVERSITAS ANDALAS

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APLIKASI CENDAWAN *Beauveria bassiana* (Bals.) Vuill PADA BENIH PADI DAN PENGARUHNYA TERHADAP STATISTIK DEMOGRAFI WERENG BATANG COKLAT (*Nilaparvata lugens* Stal)

APLICATION OF *Beauveria bassiana* (Bals.) Vuill IN RICE SEEDS AND ITS EFFECTS ON STATISTICAL DEMOGRAPHY BROWN PLANTHOPPER (*Nilaparvata lugens* Stal)

Abstrak

Wereng batang coklat (*Nilaparvata lugens* Stal.) merupakan hama penting yang menyebabkan rendahnya produksi tanaman padi. Pengendalian hama ini dapat dilakukan dengan pemanfaatan agens hayati seperti *Beauveria bassiana* (Bals.) Vuill. Tujuan penelitian adalah untuk mengetahui pengaruh cendawan *B bassiana* yang diinduksikan melalui perendaman benih terhadap statistik demografi Wereng Batang Coklat (WBC) dan perubahan kandungan biokimia batang padi. Penelitian disusun dalam Rancangan Acak Lengkap (RAL) faktorial. Faktor I perbedaan tanah steril dan tidak steril, Faktor II jenis isolat *B.bassiana* yaitu: BbJg, BbWS, Pb211, Td312 dan kontrol. Konsentrasi *B. bassiana* yang digunakan adalah 10^8 konidia/ml. Data diolah menggunakan sidik ragam atau analisis of variance (ANOVA), dan dilanjutkan dengan uji LSD taraf nyata 5%. Hasil penelitian menunjukkan bahwa tidak ada interaksi antara faktor tanah dan isolat terhadap parameter statistik demografi WBC. Faktor berbagai isolat *B. bassiana* yang diaplikasikan melalui perendaman benih memberikan pengaruh nyata terhadap kesintasan (l_x) dan fekunditas (m_x) menunjukkan tingkat kesintasan (*survivorship*) WBC menjadi lebih rendah dan mundurnya waktu reproduksi, menekan laju reproduksi kotor (GRR) 96,05 individu/generasi, dan laju reproduksi bersih (Ro) 29,26 individu/induk/generasi, memperpanjag laju pertumbuhan intrinsik (r_m) 0,09129 individu/induk/hari, memperpanjang rataan lama generasi (T) 37,69 hari dan Doubling time (DT) 7,95 hari. Isolat cendawan *B. bassiana* yang paling efektif dan menekan perkembangan populasi WBC adalah isolat BbJg dan BbWS.

Semua isolat cendawan *B. bassiana* mampu meningkatkan kandungan metabolit sekunder (asam salisilat, asam oksalat) dan menurunkan kandungan

metabolit primer (sukrosa) pada batang tanaman padi dan kemampuan tersebut lebih efektif pada perlakuan isolat BbWS. Perubahan kandungan metabolit pada batang padi paling berpengaruh pada padi yang ditanam di tanah tidak steril

Keywords : *Beauveria bassiana*, Entomopatogen, *Nilaprvata lugens*, cendawan endofit

Abstract

Brown planthopper or BPH, (*Nilaparvata lugens* Stal.) is an important pest that causes low rice production.. This pest can be controlled by using biological agents, for example, *Beauveria bassiana* (Bals.) Vuill. The study was to determine the effect of *B bassiana* inoculated through seed soaking on the demographic statistics of the Brown Planthopper (BPH) and biochemical changes in rice stems. The study was arranged in a factorial Completely Randomized Design (CRD). Factor I is the difference between sterile and non-sterile soil, Factor II is *B. bassiana* isolates, namely: BbJg, BbWS, Pb211, Td312 and control. The concentration of *B. bassiana* used was 10^8 conidia/ml. The data was processed using analysis of variance (ANOVA), and continued with the LSD test with a 5% significance level. The results showed that there was no interaction between soil and isolation factors on the statistical parameters of BPH demographics. Factors of various isolates of *B. bassiana* which were applied through soaking the seeds gave a significant effect on survival (lx) and fecundity (mx) indicating a lower BPH survival rate and a delay in reproduction time, suppressing the gross reproduction rate (GRR) of 96.05 individuals/generation, and net reproduction rate (Ro) 29.26 individuals/parent/generation, prolonging the intrinsic growth rate (rm) 0.09129 individuals/parent/day, prolonging the mean generation time (T) 37.69 days and doubling the time (DT) 7.95 days. The most effective isolates of the fungus *B. bassiana* in suppressing the development of BPH population were BbJg dan BbWS isolates.

All isolates of the fungus *B. bassiana* were able to increase the content of secondary metabolites (salicylic acid, oxalic acid) and decrease the content of primary metabolites (sucrose) in rice stems and this ability was more effective in

the treatment of BbWS isolates. Changes in the content of metabolites in rice stems have the most effect on rice grown in unsterile soil

Keywords : *Beauveria bassiana, Entomopatogenic fungus, Nilaprvata lugens, population endemik BPH, Biocontrol agens*

UJI LAPANG APLIKASI BERBAGAI ISOLAT CENDAWAN *Beauveria bassiana* Bals. Vuill DALAM MENGENDALIKAN WERENG BATANG COKLAT (Nilaparvata lugens Stall) DI DAERAH ENDEMIK

FIELD TESTING OF VARIOUS APPLICATIONS OF *Beauveria bassiana* Balls. Vuill IN CONTROLLING BROWN PLANTHOPPER (Nilaparvata lugens Stall) IN ENDEMIC AREAS

Abstrak

Pengendalian wereng batang coklat (*Nilaparvata lugens* Stal.) atau WBC dapat dilakukan dengan pemanfaatan agens hayati salah satunya menggunakan cendawan *Beauveria bassiana* (Bals.) Vuill. Tujuan penelitian adalah untuk mengetahui pengaruh cendawan *B bassiana* yang diaplikasikan melalui perendaman benih, perendaman akar, peyemprotan pada tanaman padi dan pengaruhnya terhadap serangan WBC dilahan endemik WBC. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) dengan 6 perlakuan yaitu *B. bassiana* isolat BbJg, BbWS, Pb211, Td312, kontrol, dan pestisida sintetik. Data diolah menggunakan sidik ragam atau analisis of variance (ANOVA), dan dilanjutkan dengan uji LSD taraf nyata 5%. Hasil Penelitian menunjukan bahwa Cendawan *B. bassiana* yang diaplikasikan melalui perendaman benih, perendaman akar, penyemprotan tanaman padi dalam skala lapangan, mampu menekan populasi WBC dengan total populasi sebanyak 122,34 ekor/rumpun. Menurunkan persentase tanaman terserang sampai 51.82%, dan menurunkan intensitas serangan sampai 15.00%.

Keywords : *Beauveria bassiana,* Entomopatogen, *Nilaprvata lugens,* cendawan endofit

Abstract

Control of brown planthopper (*Nilaparvata lugens* Stal.) or BPH can be done by using biological agents, one of which is the fungus *Beauveria bassiana* (Bals.) Vuill. The aim study was to determine the effect of the fungus *B bassiana* which was applied through seed immersion, root immersion, spraying on rice plants and its effect on BPH attack on BPH endemic land. This study used a randomized block design (RAK) with 6 treatments of *B. bassiana* isolates BbJg,

BbWS, Pb211, Td312, control, and synthetic pesticides. The data was processed using analysis of variance (ANOVA), and continued with the LSD test with a 5% significance level. The results showed that *B. bassiana*, which was applied through seed soaking, root soaking, and spraying of rice plants on a field scale, was able to suppress the BPH population with a total population of 122.34 individuals/clump. Reducing the percentage of affected plants to 51.82%, and reducing the intensity of attack to 15.00%.

Keywords : *Beauveria bassiana, Entomopatogenic fungus, Nilaprvata lugens, population endemik BPH, Biocontrol agens*