

ABSTRAK

SKRINING JAMUR AGENSIA HAYATI UNTUK MENEKAN PERKEMBANGAN PENYAKIT BUSUK PANGKAL BATANG (BPB) PADA TANAMAN KELAPA SAWIT (*Elaeis guineensis* Jacq.)

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Penelitian ini bertujuan untuk mengetahui kemampuan antagonis jamur *Ganoderma boninense*, pelarut fosfat, isolat terbaik, *Plant Growth Promoting Fungi* (PGPF) dan pengaruh aplikasi bifungisida untuk menekan serangan *G. boninense* secara *in planta*. Penelitian yang dilakukan meliputi pengujian antagonis *G. boninense*, antagonis dikelompokkan berdasarkan nilai penghambatan. Pengujian selanjutnya yaitu pelarut fosfat, pengujian ini dikelompokkan berdasarkan nilai indeks pelarut fosfat. Pengujian hipovirulen dilakukan terhadap empat isolat terpilih yang dikelompokkan berdasarkan skor *Disease Severity Index* (DSI). Pengujian *Plant Growth Promoting Fungi* (PGPF) menggunakan Rancangan Acak Kelompok (RAK). Pengujian secara *in planta* dilakukan dengan mengaplikasikan formulasi biofungisida ke tanaman sawit dan menggunakan Rancangan Acak Kelompok (RAK). Data yang diperoleh diuji Anova dan selanjutnya menggunakan uji DMRT 5%.

Hasil penelitian menunjukkan bahwa 21 isolat jamur antagonis yang diuji penghambatan dan pelarut fosfat diperoleh empat isolat terbaik yang memiliki persentase penghambatan paling tinggi yaitu PHRE RKI U2.1, PNBE RKN U2.1, WT2 dan 9 PNRE A24 (1) PCA. 21 isolat jamur yang diuji, tidak terdapat jamur yang berperan sebagai pelarut fosfat. empat isolat jamur terpilih berasal dari genus *Trichoderma* sp. (PHRE RKI U2.1, PNBE RKN U2.1 dan WT2), dan 1 isolat berasal dari genus *Penicillium* sp. Pertumbuhan koloni jamur isolat terpilih menunjukkan hasil tiga isolat (PHRE RKI U2.1, PNBE RKN U2.1 dan WT 2) dapat memenuhi cawan, sedangkan isolat 9 PNRE A 24(1) PCA tidak dapat dihitung karena koloni jamur menyebar. Isolat PHRE RKI U2.1 dan PNBE RKN U2.1 memiliki kerapatan spora yang tinggi. Semua isolat terpilih yang dapat berkecambah 100% pada 12 jam setelah inkubasi. Keempat isolat terpilih bersifat hipovirulen, empat isolat terpilih diuji kemampuannya sebagai *Plant Growth Promoting Fungi* (PGPF). Hasil menunjukkan bahwa tidak terdapat beda nyata antara kontrol dengan perlakuan. Pengujian pengaruh aplikasi jamur antagonis

terhadap keparahan penyakit pada daun dan keterjadian penyakit tanaman menunjukkan beda nyata antara kontrol dengan P1 (PHRE RKI U2.1) dan tidak berbeda nyata dengan P5 (heksakonasol). Dari pengujian pengaruh aplikasi jamur antagonis terhadap kemunculan badan buah *Ganoderma* menunjukkan hasil beda nyata antara kontrol dengan semua perlakuan. Pada variabel tinggi tanaman tidak terdapat beda nyata antara kontrol dengan perlakuan. Pengaruh aplikasi jamur antagonis terhadap kehijauan dan jumlah daun menunjukkan hasil beda nyata antara kontrol dengan perlakuan.

Kata kunci: *Ganoderma boninense*, hipovirulen, *in planta*, pelarut fosfat, *Plant Growth Promoting Fungi* (PGPF).

ABSTRACT

SCREENING OF FUNGAL BIOLOGICAL AGENTS TO SUPPRESS THE DEVELOPMENT OF STEM ROT DISEASE (SRD) IN OIL PALM (*Elaeis guineensis* Jacq.) PLANTS

By

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This study aims to determine the antagonistic ability of *Ganoderma boninense* fungi, phosphate solubilizer, the best isolate, Plant Growth Promoting Fungi (PGPF), and the effect of fungicide application in suppressing *G. boninense* in infection in planta. The study conducted includes testing the antagonism of *G. boninense*, *G. boninense*, with antagonists grouped based on inhibition values. The next test is phosphate solubilizers, which are grouped based on phosphate solubilization index values. A hypovirulent test was carried out on four selected isolates, grouped based on Disease Severity Index (DSI) scores. The Plant Growth Promoting Fungi (PGPF) test was conducted using a Randomized Block Design (RBD). In planta testing was conducted by applying the biofungicide formulation to oil palm plants using a Randomized Block Design (RBD). The data obtained were analyzed using ANOVA, followed by a 5% DMRT test.

The results of the study showed that from the 21 antagonistic fungal isolates tested for inhibition and phosphate solubilization, four best isolates were obtained with the highest inhibition percentages: PHRE RKI U2.1, PNBE RKN U2.1, WT2, and 9 PNRE A24 (1) PCA. Of the 21 fungal isolates tested, none of the fungi acted as phosphate solubilizers. The four selected fungal isolates were from the genus *Trichoderma* sp. (PHRE RKI U2.1, PNBE RKN U2.1, and WT2), and one isolate was from the genus *Penicillium* sp. The colony growth of the selected isolates showed that three isolates (PHRE RKI U2.1, PNBE RKN U2.1, and WT2) were able to cover the Petri dish, while the isolate 9 PNRE A24(1) PCA could not be counted due to the spreading of the fungal colonies. The isolates PHRE RKI U2.1 and PNBE RKN U2.1 exhibited high spore density. All selected isolates showed 100% germination within 12 hours of incubation. The four selected isolates were hypovirulent. Their ability as Plant Growth Promoting Fungi (PGPF) was tested, and the results showed no significant difference between the control and the treatments. The testing of the effect of antagonistic fungus application on disease severity in leaves and disease occurrence showed a

significant difference between the control and P1 (PHRE RKI U2.1), but no significant difference with P5 (hexaconazole). The testing of the effect of antagonistic fungus application on the appearance of *Ganoderma* fruiting bodies showed a significant difference between the control and all treatments. The effect of antagonistic fungus application on greenness and leaf number showed a significant difference between the control and the treatments.

Keywords: *Ganoderma boninense*, hypovirulent, in planta, phosphate solubilizers, Plant Growth Promoting Fungi (PGPF).