

Uji Aktivitas Antifungi Isolat Bakteri Saluran Pencernaan Larva Lalat Tentara Hitam (*Hermetia illucens* L.) terhadap Fungi Patogen Tanaman = Antifungal Activity Assay of Black Soldier Fly (*Hermetia illucens* L.) Larvae Gut Bacteria Isolates against Plant Pathogenic Fungi

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Abstrak

Pertanian merupakan salah satu sektor utama yang berperan dalam perkembangan ekonomi Indonesia. Produktivitas pertanian dan ketahanan pangan berkaitan erat dengan kondisi kesehatan tanaman. Salah satu patogen penginfeksi tanaman adalah fungi. Pengendali hayati atau biokontrol merupakan teknik pengendalian menggunakan aktivitas metabolisme agen hayati seperti bakteri untuk mengendalikan patogen tanaman. Penelitian terdahulu berhasil mengisolasi bakteri saluran pencernaan black soldier fly larvae (BSFL) dan diketahui mampu mendukung pertumbuhan tanaman. Penelitian ini bertujuan untuk mengetahui kemampuan 10 isolat bakteri saluran pencernaan BSFL terhadap 4 fungi patogen tanaman, yaitu *Ganoderma boninense*, *Fusarium oxysporum*, *Colletotrichum siamense* KA, dan *Curvularia lunata* BM. Pengujian aktivitas antifungi isolat bakteri dilakukan melalui uji aktivitas antagonistik dan uji aktivitas antibiosis yang dilanjutkan dengan uji aktivitas enzim ekstraseluler isolat potensial. Uji aktivitas antagonistik menggunakan metode dual culture secara kualitatif dan semi-kuantitatif. Uji aktivitas antibiosis menggunakan filtrat medium fermentasi berusia 5 hari yang dicampur dengan bubuk medium potato dextrose agar. Uji aktivitas enzim ekstraseluler isolat potensial meliputi uji enzim protease, lipase, amilase, kitinase, dan selulase menggunakan medium selektif. Hasil uji aktivitas antagonistik menunjukkan 4 dari 10 isolat bakteri saluran pencernaan BSFL, yaitu G7, G17, G20, G21 mampu menghambat pertumbuhan keempat fungi uji. Hasil uji aktivitas antibiosis menunjukkan bahwa efektivitas terbesar diperoleh dari filtrat medium fermentasi isolat G17 dalam menghambat pertumbuhan fungi *Ganoderma boninense* dengan persentase hambatan sebesar 85,56% – 91,98%. Hasil uji aktivitas enzim menunjukkan isolat G17 memiliki aktivitas enzim ekstraseluler protease, lipase, dan kitinase. Isolat G17 teridentifikasi sebagai *Stenotrophomonas maltophilia*.

.....Agriculture is one of the main sectors that play a role in Indonesia's economic development. Agricultural productivity and food security are closely related to plant health conditions. One of the plant infecting pathogens is a fungus. Biological control or biocontrol is a control technique using the metabolic activity of biological agents such as bacteria to control plant pathogens. Previous studies have succeeded in isolating black soldier fly larvae (BSFL) gut bacteria and are known to be able to support plant growth. This study aims to determine the ability of 10 bacterial isolates from BSFL gut against 4 plant pathogenic fungi, namely *Ganoderma boninense*, *Fusarium oxysporum*, *Colletotrichum siamense* KA, and *Curvularia lunata* BM. Antifungal activity assay of bacterial isolates was carried out through antagonistic activity assay and antibiosis activity assay followed by potential isolates extracellular enzyme activity assay. The antagonistic activity assay used the dual culture method qualitatively and semi-quantitatively. The antibiosis activity assay used 5 days old fermented medium filtrate mixed with potato dextrose agar medium powder. The extracellular enzyme activity assay of potential isolates included protease, lipase, amylase, chitinase, and cellulase enzyme assay using selective media. The results of the antagonistic activity assay showed that 4 out of 10 BSFL digestive tract bacterial isolates namely G7, G17, G20, G21 were able to inhibit the growth

of the four tested fungi. The results of the antibiosis activity assay showed that the greatest effectiveness was obtained from the fermented medium filtrate of isolate G17 in inhibiting the growth of the *Ganoderma boninense* fungus with an inhibition percentage of 85.56% – 91.98%. The results of the enzyme activity assay showed that isolate G17 had extracellular enzyme activity of protease, lipase, and chitinase. Isolate G17 was identified as *Stenotrophomonas maltophilia*.