

## INTISARI

### PENEKANAN PENYAKIT HAWAR DAUN BAKTERI PADI DENGAN EKSTRAK BAWANG PUTIH DAN PENGARUHNYA TERHADAP EKSPRESI GEN T3SS REGULATOR PATOGEN

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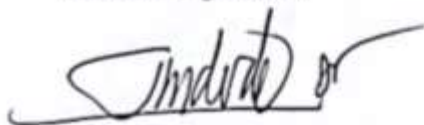
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Penyakit hawar daun bakteri pada padi disebabkan oleh *Xanthomonas oryzae* pv. *oryzae*. Penyakit ini menimbulkan masalah yang signifikan dalam produksi padi karena dapat mengakibatkan kehilangan hasil sekitar 10–50%. Virulensi, patogenisitas, dan kolonisasi sel inang diatur oleh gen *hypersensitive respon and pathogeneticity (hrp)*, yang bertugas dalam menyuntikkan dan mengirimkan protein efektor ke tanaman inang melalui sistem sekresi tipe III (T3SS). Salah satu strategi upaya pengendalian penyakit hawar daun bakteri adalah penggunaan varietas padi tahan dengan ekstrak bawang putih. Penelitian ini bertujuan untuk mengevaluasi efektivitas ekstrak bawang putih dalam menghambat pertumbuhan *Xoo* secara *in vitro*, menekan gejala hawar daun secara *in vivo*, dan mengurangi ekspresi gen regulator T3SS *hrpG* dan *hrpX*. Isolat bakteri yang digunakan adalah *Xanthomonas oryzae* pv. *oryzae*. Uji *in vitro* dilakukan dengan menggunakan konsentrasi ekstrak bawang putih 100%, 75%, 50%, dan 25%. Uji *in vivo* dilakukan dengan menggunakan dua varietas padi: Mekongga (tahan) dan Ciherang (rentan). Aplikasi ekstrak bawang putih 75% berhasil menghambat pertumbuhan *Xoo* dan mengurangi gejala hawar daun bakteri pada kedua varietas dengan menurunkan insidensi penyakit, Intensitas penyakit, laju infeksi, AUDPC, dan ekspresi gen *hrpG* dan *hrpX*. Kata kunci: bawang putih, padi, T3SS, *Xanthomonas oryzae* pv. *oryzae*

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## ABSTRACT

### SUPPRESSION OF BACTERIAL LEAF BLIGHT DISEASES WITH GARLIC EXTRACT AND ITS EFFECT ON EXPRESSION REGULATORY GENE T3SS PATHOGEN

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Bacterial leaf blight disease in rice is caused by *Xanthomonas oryzae* pv. *oryzae*. This disease causes significant problems in rice production because it can result in yield losses of around 10–50%. Virulence, pathogenicity, and host cell colonization are regulated by the *hypersensitive response and pathogeneticity (hrp)* gene, which is responsible for injecting and delivering effector proteins to the host plant through the type III secretion system (T3SS). One strategy for controlling bacterial leaf blight disease is the use of resistant rice varieties with garlic extract. This study aims to evaluate the effectiveness of garlic extract in inhibiting the growth of *Xoo* *in vitro*, suppressing leaf blight symptoms *in vivo*, and reducing the expression of T3SS regulator genes *hrpG* and *hrpX*. The bacterial isolate used was *Xanthomonas oryzae* pv. *oryzae*. In vitro tests were carried out using garlic extract concentrations of 100%, 75%, 50%, and 25%. In vivo tests were conducted using two rice varieties: Mekongga (resistant) and Ciherang (susceptible). Application of 75% garlic extract successfully inhibited the growth of *Xoo* and reduced symptoms of bacterial leaf blight in both varieties by reducing disease incidence, disease intensity, infection rate, AUDPC, and *hrpG* and *hrpX* gene expression.

Keywords: garlic, rice, T3SS, *Xanthomonas oryzae* pv. *oryzae*

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