

ANALISIS MOLEKULER *Burkholderia glumae* PENYEBAB PENYAKIT HAWAR MALAI PADA TANAMAN PADI

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INTISARI

Penyakit hawar malai yang disebabkan oleh *Burkholderia glumae* mulai banyak dilaporkan menginfeksi tanaman padi di Indonesia. Belum ada laporan mengenai kerugian akibat infeksi *B. glumae* di Indonesia, namun sifatnya yang tular benih dapat meningkatkan potensi menyebar ke wilayah lain. Penelitian ini bertujuan untuk mengetahui wilayah sebar penyakit hawar malai di Jawa, mendeteksi berdasarkan daerah ITS dan gen *gyrB*, serta mengetahui kekerabatan antar isolat yang diperoleh. Metode yang dilakukan meliputi survei dan pengambilan sampel biji padi di Jawa. *B. glumae* pada biji padi dideteksi menggunakan primer BGF/BGR spesifik terhadap sekuen ITS dan primer gluFW/gluFR spesifik terhadap gen *gyrB*. Analisis keragaman genetik dengan teknik *rep*-PCR menggunakan primer BOXAIR, kemudian dianalisis urutan basa nukleotidanya berdasarkan gen *gyrB* untuk mengetahui kekerabatannya. Hasil survei di lapangan diperoleh 21 sampel biji yang terdiri dari 11 varietas padi dari sembilan wilayah di Jawa. Isolasi *B. glumae* menggunakan medium semi-selektif menghasilkan 101 isolat, namun deteksi menggunakan primer BGF/BGR hanya 8 isolat yang positif sebagai *B. glumae*. Dari 8 isolat, hanya tujuh isolat yang dapat teramplifikasi oleh primer gluFW/gluRW. Hasil analisis teknik *rep*-PCR menunjukkan bahwa terdapat keragaman diantara kedelapan isolat tersebut. Urutan basa dari dua isolat (IRP.3 dan InSB.6a) dianalisis dan dibandingkan dengan *B. glumae* dari *GenBank* berdasarkan gen *gyrB*. Hasilnya menunjukkan bahwa isolat InSB.6a dan IRP.3 masing-masing memiliki tingkat similaritas 100% dan 99% dengan *B. glumae* strain GRBB 6, DOA-BG14 dan H91. Penelitian ini menunjukkan bahwa penyakit hawar malai sudah terdeteksi pada varietas padi di beberapa lokasi di Jawa seperti varietas Ciherang asal Cirebon, IR64 asal Purworejo, Inpari Sidenuk dan Situ Bagendit asal Banyuwangi serta Ciherang asal Jember. Isolat yang diperoleh yaitu IRP.3 dan InSB.6a memiliki tingkat similaritas tinggi dengan isolat *B. glumae* yang telah disimpan dalam *database Genbank*.

Kata Kunci: biji padi, *Burkholderia glumae*, hawar malai, padi

MOLECULAR ANALYSIS OF *Burkholderia glumae*, A CAUSAL AGENT OF BACTERIAL PANICLE BLIGHT IN RICE

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ABSTRACT

Bacterial panicle blight caused by *Burkholderia glumae* has been reported to infect rice plants in Indonesia. There have been no reports of yield losses due to *B. glumae* infection, but this pathogen is seed-borne so that it can increase the potential spread to other areas. This study aims to determine the spread of the disease area of bacterial panicle blight in Java, to detect *B. glumae* based on the ITS region and *gyrB* gene, and to know the genetics diversity among the isolates. Methods for this research include surveys and random sampling of rice seeds in Java. Detection of *B. glumae* was performed both on rice seed and bacterial isolates molecularly using the primer pair of BGF/BGR for specific region in ITS and gluFW/gluRW for the specific region in *gyrB* gene. Analysis of genetic diversity using *rep*-PCR technique by the primer of BOXAIR, and DNA sequencing of the amplified fragments of its *gyrB* gene. The surveys was done by collecting 28 seed samples consisting of 11 rice varieties from nine regions in Java. The isolation resulted on 101 isolates, but only 8 isolates of them were detected as *B. glumae* using the primers of BGF/BGR primer. Seven isolates were able to be amplified using the primers of gluFW/gluRW. The result of *rep*-PCR analysis showed that there was a high genetic diversity among the 8 isolates. The sequences of two isolates (IRP.3 and InSB.6a) were analyzed and compared to the sequence of *B. glumae* from GenBank data based on the *gyrB* gene. It showed that the isolates of InSB.6a and IRP.3, each had 100% dan 99% similarity value to that of *B. glumae* strain GRBB 6, DOA-BG14 and H91. This study shows that bacterial panicle blight disease has found in several location in Java, i.e. rice varieties of Ciherang from Cirebon, IR64 from Purworejo, Inpari Sidenuk and Situ Bagendit from Banyuwangi and Ciherang from Jember.

Keywords: *bacterial panicle blight, Burkholderia glumae, rice, rice seed*