

INTISARI

Penyakit hawar daun bakteri atau *Bacterial Leaf Blight* (BLB) merupakan salah satu penyakit penting tanaman padi di Indonesia yang disebabkan oleh bakteri *Xanthomonas oryzae* pv. *oryzae*. Salah satu alternatif pengendalian penyakit BLB adalah dengan memanfaatkan bakteri *Paenibacillus polymyxa* yang termasuk dalam bakteri PGPR (*Plant Growth Promoting Rhizobacteria*). PGPR yaitu sejenis bakteri yang hidup disekitar perakaran tanaman atau rizosfer tanaman yang mampu menginduksi ketahanan tanaman dan bersifat antagonis terhadap patogen penyebab penyakit tanaman. Penelitian ini bertujuan untuk mendapatkan isolat *Paenibacillus polymyxa* dan mengetahui pengaruh aplikasi pengendali hayati *Paenibacillus polymyxa* dalam menghambat pertumbuhan bakteri patogen *Xanthomonas oryzae* pv. *oryzae* juga terhadap tinggi tanaman. Bakteri *P. polymyxa* diisolasi dari perakaran tanaman padi sehat diantara tanaman padi yang terserang penyakit BLB. Isolat bakteri yang diperoleh dilakukan uji molekuler menggunakan primer spesifik Pp268F dan Pp268R. Dari 11 isolat bakteri rizosfer yang diperoleh terdapat 2 isolat bakteri yang diduga merupakan bakteri *P. polymyxa* sebab positif ketika di uji molekuler dan dapat menghambat pertumbuhan patogen secara *in vitro* yaitu bakteri KT 9.9 dengan potensi daya hambat kuat dan KT 9.11 dengan potensi daya hambat lemah. Isolat KT 9.9 bersifat gram negatif dan menghasilkan gejala nekrotik pada uji hipersensitif sedangkan pada isolat KT 9.11 bersifat gram positif dan tidak bergejala pada uji hipersensitif. Uji pengendalian secara *in planta* menunjukkan isolat bakteri KT 9.9 mampu menekan kejadian penyakit BLB sebesar 62,5% sedangkan isolat KT 9.11 mampu menekan kejadian penyakit BLB sebesar 57,5%. Pada perlakuan tinggi tanaman isolat KT 9.9 mampu meningkatkan tinggi tanaman dibandingkan kontrol sedangkan perlakuan KT 9.11 kurang mampu meningkatkan tinggi tanaman dibandingkan dengan kontrol.

Kata kunci: penyakit BLB, *X. oryzae* pv. *oryzae*, *P. polymyxa*, PGPR, akar padi.

ABSTRACT

Bacterial Leaf Blight (BLB) is one of the important diseases of rice plants in Indonesia which is caused by *Xanthomonas oryzae* pv. *oryzae*. One of the alternatives to control BLB disease is to use the *Paenibacillus polymyxa* bacteria which is included in the PGPR (Plant Growth Promoting Rhizobacteria) bacteria. PGPR is a type of bacteria that lives around plant roots or plant rhizosphere which is able to induce plant resistance and is antagonistic to plant disease-causing pathogens. This study aims to obtain *Paenibacillus polymyxa* and to determine the effect of *Paenibacillus polymyxa* biological control application in inhibiting the growth of pathogenic bacteria *Xanthomonas oryzae* pv. *oryzae* also on plant height. *P. polymyxa* bacteria was isolated from the roots of healthy rice plants among rice plants attacked by BLB diseases. The bacterial isolates obtained were carried out by molecular tests using specific primers Pp268F and Pp268R. Of the 11 isolates of rhizosphere bacteria, there were 2 bacterial isolates that were thought to be *P. polymyxa* bacteria because they were positive when tested in molecular terms and could inhibit the growth of pathogens in vitro, namely KT 9.9 bacteria with strong inhibitory potential and KT 9.11 with weak inhibitory potential. KT 9.9 isolate was gram negative and produced necrotic symptoms in the hypersensitive test, while KT 9.11 isolate was gram-positive and asymptomatic in the hypersensitive test. The in plant control test showed that the KT 9.9 bacterial isolate was able to reduce the BLB disease incidence by 62.5% while the KT 9.11 isolate was able to reduce the BLB disease incidence by 57.5%. In the treatment of plant height, the KT 9.9 isolate was able to increase plant height compared to the control, while the KT 9.11 treatment was less able to increase plant height compared to the control.

Keywords: BLB disease, *X. oryzae* pv. *oryzae*, *P. polymyxa*, PGPR, rice root