

RINGKASAN

Penyakit Hawar Daun Bakteri (HDB) atau yang sering dikenal dengan penyakit kresek merupakan salah satu penyakit penting yang dapat menurunkan produksi tanaman padi. Penyebab penyakit hawar daun adalah bakteri *Xanthomonas oryzae* pv. *oryzae*. Salah satu cara pengendalian yang dapat dilakukan yaitu dengan pemanfaatan agensia hayati bakteri endofit. Bakteri endofit merupakan jenis bakteri yang dapat hidup dan berasosiasi dengan jaringan tanaman tanpa menimbulkan suatu gejala penyakit pada tanaman tersebut. Bakteri endofit sebagai agens biokontrol memiliki kelebihan dibandingkan agen biokontrol lainnya. Keberadaannya dalam jaringan tanaman, membuat bakteri endofit mempunyai kemampuan bertahan terhadap tekanan biotik dan abiotik. Penelitian ini bertujuan untuk mendapatkan bakteri endofit dari akar padi di beberapa daerah meliputi Karangwangkal, Sumbang, Rawalo, dan Somagede. Selain itu, diharapkan dengan penelitian ini dapat diketahui bakteri endofit yang efektif untuk mengendalikan penyakit hawar daun pada tanaman padi serta pengaruhnya pada pertumbuhan tanaman padi.

Penelitian ini dilaksanakan pada bulan Mei sampai dengan November 2019 di Laboratorium Perlindungan Tanaman dan kebun percobaan Fakultas Pertanian Universitas Jenderal Soedirman Purwokerto. Penelitian dilakukan dalam tiga tahap yaitu eksplorasi bakteri endofit dari empat lahan, secara *in-vitro* di Laboratorium Perlindungan Tanaman dan *in-planta* di rumah plastik Fakultas Pertanian Universitas Jenderal Soedirman Purwokerto. Penelitian ini menggunakan Rancangan Acak Lengkap pada uji *in-vitro* dan Rancangan Acak Kelompok pada uji *in-planta* dengan Sembilan perlakuan dan tiga ulangan. Perlakuan terdiri atas kontrol dan delapan bakteri endofit. Variabel yang diamati meliputi zona bening, mekanisme antagonis, masa inkubasi, intensitas penyakit, AUDPC, tinggi tanaman, jumlah daun, jumlah rumpun, kehijauan daun, panjang akar, volume akar, bobot segar akar, bobot segar tajuk, bobot segar tanaman, bobot kering akar, bobot kering tajuk, dan bobot kering tanaman.

Hasil penelitian menunjukkan bahwa bakteri endofit yang telah diisolasi dari akar padi dari daerah Karangwangkal, Sumbang, Rawalo, dan Somagede diperoleh 8 isolat meliputi B1, B2, B3, B4, B5, B6, B7, dan B8. Penyebab penyakit hawar daun pada tanaman padi teridentifikasi *Xanthomonas oryzae* pv. *oryzae*. Berdasarkan hasil uji *in-vitro*, bakteri endofit isolat B3 asal Karangwangkal memiliki tingkat penghambatan paling besar yaitu dengan membentuk zona hambatan sebesar 10,3 mm dengan mekanisme penghambatan bakteriostatik. Hasil uji *in-planta* menunjukkan bahwa bakteri endofit isolat B3 dapat menunda masa inkubasi paling lama dan memiliki tingkat intensitas penyakit serta nilai AUDPC paling rendah dibandingkan dengan perlakuan yang lainnya. Perlakuan isolat bakteri endofit B3 asal Karangwangkal dan B5 asal Sumbang secara *in-planta* dapat meningkatkan tinggi tanaman, kehijauan daun, jumlah rumpun, dan jumlah daun.

Kata kunci : bakteri endofit, hawar daun, padi, *Xanthomonas oryzae* pv. *oryzae*

SUMMARY

*Bacterial Leaf Blight (BLB) or or what we are familiar with with crackle disease is one of the important diseases that can reduce the production as well as quality of rice plants. This disease is caused by *Xanthomonas oryzae* pv. *oryzae*. To overcome this situation, one of the methods that can be used to control BLB is utilization of endophytic bacterial as biological agents. Endophytic bacteria is a bacterial type in which they live and associate with the plant tissue and show asymptomatic issues. This bacteria also act as biocontrol agents that have advantages compared to the other biocontrol agents. The reason behind this is their presence in plant tissues, helping them to survive from biotic and abiotic pressures. The goal of this study is to obtain endophytic bacteria from rice roots in several areas including Karangwangkal, Sumbang, Rawalo, and Somagede. In addition, this research is expected to be an alternative way to find out the effectiveness of endophytic bacteria in controlling BLB in rice plants and their effects on the plant growth.*

This research was conducted from May to November 2019 at Plant Protection Laboratory and experimental gardens at Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. The research was divided into three stages that consist of; the exploration of endophytic bacteria from 4 different fields at various location as mentioned before, in-vitro experimental study at Plant Protection Laboratory, and in-planta study at Plastic House of Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. This study arranged with a Completely Randomized Design during in-vitro test besides, for in planta test, Randomized Block Design was used. Both of the methods were treated with nine treatments and three replication. The treatments consist of control and eight endophytic bacterias. In this experiments, there are several Variables observed included clear zone, inhibitory mechanism, incubation period, disease intensity, AUDPC (Area Under The Disease Progress Curve), plant height, number of leaves, presence of the young rice, color of the leaves, root length, root volume, fresh weight of the root, canopy and the plant as well as their dry weight.

*The results showed that endophytic bacteria isolated from rice roots from Karangwangkal, Sumbang, Rawalo, and Somagede areas obtained 8 isolates including B1, B2, B3, B4, B5, B6, B7, and B8. In this case, BLB in rice plants was identified to be caused by *Xanthomonas oryzae* pv. *oryzae*. Based on the results of in-vitro tests, endophytic B3 from Karangwangkal isolates have the greatest inhibitory rate proven by forming 10.3 mm of inhibition zone with bacteriostatic inhibition mechanism. Furthermore, In-planta test results showed that B3 endophytic isolate bacteria cause the longest delay in the incubation period compared to the control. Thus, it has the highest resistency against the pathogen as well as the lowest level of AUDPC value than the other treatments. meanwhile, for In-planta treatment of endophytic B3 from Karangwangkal and B5 from Sumbang isolates have potential to increase plant height, color of the leaves, presence of the young rice, and number of leaves.*

*Keyword : Bacterial Leaf Blight, endophytic bacteria, rice, Xanthomonas oryzae
pv. oryzae*

