

ABSTRAK

Penelitian ini bertujuan untuk 1) mempelajari efektivitas bakteri endofit akar padi dalam menekan pertumbuhan jamur *R. solani* secara *in vitro*, 2) mempelajari efektivitas bakteri endofit akar padi dalam menekan penyakit hawar pelepah padi secara *in planta*. Penelitian ini dilakukan di Laboratorium Perlindungan Tanaman dan *screen house* Fakultas Pertanian Universitas Jenderal Soedirman, mulai bulan Desember 2019 hingga September 2020. Bakteri endofit hasil isolasi diidentifikasi morfologi serta diseleksi berdasarkan daya hambat terhadap pertumbuhan *R. solani* di laboratorium. Bakteri endofit yang memiliki daya hambat terhadap *R. solani* kemudian diuji secara *in planta* dengan fungisida kimia sebagai pembandingnya. Variabel yang diamati meliputi masa inkubasi, intensitas penyakit, laju infeksi, tinggi tanaman, jumlah anakan, bobot segar tanaman, bobot segar akar, volume akar, bobot kering tanaman, dan bobot kering akar. Tanaman terbaik selanjutnya diisolasi untuk mengetahui keberadaan bakteri endofit dalam jaringan tanaman. Hasil penelitian menunjukkan bahwa bakteri endofit yang berhasil diisolasi dan tumbuh dengan baik berjumlah 6 isolat dengan karakter yang beragam. Terdapat enam isolat bakteri yang mampu menghambat pertumbuhan *R. solani in vitro* yaitu A1, A2, A3, A4, A5, dan A6. Bakteri endofit juga mampu menekan perkembangan penyakit secara *in planta* dengan menunda masa inkubasi dan memiliki intensitas penyakit berturut-turut yaitu A1 sebesar 1,2%, A2 sebesar 4,9%, A3 sebesar 0%, A4 sebesar 1,2%, A5 sebesar 0%, dan A6 sebesar 0% serta fungisida kimia sebesar 0%. Semua bakteri endofit uji mampu menyamai kemampuan fungisida kimia dalam menekan perkembangan penyakit hawar pelepah padi. Aplikasi bakteri endofit tidak memberikan pengaruh yang nyata dalam memacu pertumbuhan tanaman. Keberadaan bakteri endofit setelah inokulasi tetap bertahan dalam jaringan tanaman dengan karakter yang sama dengan bakteri endofit yang diinokulasikan, kecuali bakteri endofit A6 yang tidak sesuai dengan karakter bakteri yang diinokulasikan.

Kata kunci : agens biokontrol, bakteri endofit, padi, penyakit hawar pelepah padi.

ABSTRACT

The research aim to : 1) studied the effectiveness of rice root endophytic bacteria in suppressing the growth of R. solani fungus in vitro, 2) studied the effectiveness of rice root endophytic bacteria in suppressing rice midrib blight in planta. This research was conducted at the Plant Protection Laboratory and screen house of the Faculty of Agriculture, Jenderal Soedirman University, from December 2019 to September 2020. The isolated endophytic bacteria were identified morphologically and were selected based on their inhibition against the growth of R. solani in the laboratory. Endophytic bacteria which have inhibitory power against R. solani were then tested in planta with chemical fungicides as a comparison. The variables observed i.e incubation period, disease intensity, infection rate, plant height, number of tillers, plant fresh weight, root fresh weight, root volume, plant dry weight, and root dry weight. The best plants were then reisolated to determine the presence of endophytic bacteria in plant tissue. The results shown that the number of endophytic bacteria that were isolated and grew well was 6 isolates with various characters. There are six bacterial isolates that are able to inhibit the growth of R. solani in vitro, i.e A1, A2, A3, A4, A5, and A6. Endophytic bacteria are also able to suppress disease progression in planta by delaying the incubation period and have the disease intensity of suppression, i.e A1 at 1,2%, A2 at 4,9%, A3 at 0%, A4 at 1,2%, A5 at 0% , and A6 at 0% and chemical fungicide at 0%. All of the tested endophytic bacteria were able to match the ability of chemical fungicides. The application of endophytic bacteria did not have a significant effect in spurring plant growth. The presence of endophytic bacteria after inoculation remained in plant tissue with the same characters as the endophytic bacteria that were inoculated, except for endophytic bacteria A6 which did not match the characteristics of the inoculated bacteria.

Keywords: biocontrol agents, endophytic bacteria, rice, sheath blight disease