RINGKASAN

Penyakit hawar daun bakteri yang disebabkan oleh *Xanthomonas axonopodis* pv. *allii* merupakan salah satu kendala utama dalam budidaya bawang merah. Upaya pengendalian dapat dilakukan melalui pemanfaatan mikroba rizosfer untuk menekan resistensi patogen, residu kimia, serta dampak negatif terhadap lingkungan. Penelitian ini bertujuan mengevaluasi potensi isolat rizosfer *Bacillus cereus* sebagai agens biokontrol penyakit hawar daun bakteri serta potensinya sebagai pupuk hayati. Penelitian dilaksanakan di lahan percobaan Desa Linggasari, Kecamatan Kembaran, Kabupaten Banyumas, sedangkan analisis potensi *B. cereus* Bm1, Bm2, Bm3, Bm4, dan konsorsium sebagai biokontrol secara *in vitro*, bertempat di Laboratorium Perlindungan Tanaman, Fakultas Pertanian UNSOED. Penelitian ini menggunakan Rancangan Acak Kelompok Lengkap (RAKL) faktorial yang terdiri atas 2 faktor dengan 3 ulangan. Faktor pertama berupa pola tanam monokultur dan tumpangsari, sedangkan faktor kedua perlakuan pupuk hayati Bm1, Bm2, Bm3, Bm4, dan Konsorsium. Variabel yang diamati adalah mekanisme enzimatis patogen *Xaa*, diameter zona hambat, intensitas penyakit, *area under the disease progress curve* (AUDPC), efektivitas pengendalian, penghasil siderofor, tingkat pelarut fosfat, aktivitas protease, dan serapan hara. Hasil penelitian menunjukkan bahwa patogen *Xaa* memiliki aktivitas protase dan selulase dalam menginfeksi tanaman. Aplikasi *B. cereus* mampu menghambat pertumbuhan *Xaa* secara *in vitro* melalui mekanisme bakteriostatik, dengan isolat Bm3 menghasilkan daya hambat sebesar 14,75 mm. Seluruh perlakuan *B. cereus* terbukti dapat menekan perkembangan penyakit dan perlakuan konsorsium memberikan hasil terbaik dengan intensitas penyakit 8,33%, efektivitas pengendalian 51,93%, serta ketahanan lebih tinggi (AUDPC=28,09%.hari) dibandingkan perlakuan lainnya pada pola tanam tumpangsari pada pengamatan keempat. Selain itu, seluruh perlakuan *B. cereus* juga berpotensi dimanfaatkan sebagai pupuk hayati karena mampu menghasilkan siderofor, pelarut fosfat, aktivitas protease, dan meningkatkan serapan hara tanaman.

SUMMARY

Bacterial leaf blight disease, caused by Xanthomonas axonopodis pv. allii, is one of the most difficult aspects of shallot farming. Rhizosphere bacteria can be used in control attempts to reduce disease resistance, residues, and adverse environmental effects. The aim of this research is to investigate the potential of Bacillus cereus rhizosphere isolates as multipurpose agents, namely biofertilizer and biocontrol of bacterial leaf blight disease. The study was conducted in the experimental field of Linggasari Village, Kembaran District, Banyumas Regency for in vivo experiments, and the analysis of the potential of B. cereus Bm1, Bm2, Bm3, Bm4, and the consortium as biocontrol in vitro conducted at the Plant Protection Laboratory, Faculty of Agriculture, UNSOED. This study used a 2 factor experiment with 3 replications in Randomized Complete Block Design (RCBD). The first factor was a monoculture and intercropping planting, while the second factor was the treatment of biofertilizer Bm1, Bm2, Bm3, Bm4, and Consortium. The variables observed were the enzymatic mechanism of the Xaa pathogen, inhibition zone diameter, disease intensity, area under the disease progress curve (AUDPC), control effectiveness, siderophore production, phosphate solubilization, protease activity, and nutrient uptake. The results demonstrated that the Xaa pathogen infects plants with cellulase and protease activities. Through a bacteriostatic mechanism, B. cereus treatment was able to stop Xaa growth in vitro with the Bm3 isolate produced an inhibitory power of 14.75 mm. All B. cereus treatments were shown to suppress disease development and the consortium treatment provided the best results with a disease intensity of 8.33%, control effectiveness of 51.93%, and higher resistance (AUDPC = 28,09%.day) compared to other treatments in the intercropping pattern in the fourth observation. Additionally, B. cereus treatments can produce siderophores, phosphate solubilization, protease activity, and enhance plant nutrient uptake, which renders them potential biofertilizers.