RINGKASAN

Jagung manis merupakan tanaman pangan penting setelah padi sebagai sumber karbohidrat dan protein dalam kebutuhan masyarakat Indonesia. Namun demikian, produksi jagung manis mengalami penurunan kualitas produksi karena gangguan organisme penggganggu tanaman (OPT). Salah satu OPT yang menyerang adalah jamur *Peronosclerospora maydis* penyebab penyakit bulai. Upaya pengendalian penyakit ini umumnya menggunakan pestisida kimia yang dapat membahayakan lingkungan dan manusia. Oleh karena itu, perlu dilakukan alternatif pengendalian secara hayati menggunakan bakteri antagonis yang berasal dari jaringan tanaman atau disebut bakteri endofit. Bakteri endofit yang dapat dijadikan agensia hayati adalah *Pseudomonas* spp. kelompok pendar. Penelitian ini bertujuan untuk 1) mengetahui potensi bakteri endofit *Pseudomonas* spp. kelompok pendar dalam mengendalikan penyakit bulai pada tanaman jagung, 2) mengetahui pengaruh pengimbasan ketahanan tanaman jagung manis oleh bakteri endofit *Pseudomonas* spp. kelompok pendar terhadap penyakit bulai, 3) mengetahui pengaruh aplikasi bakteri endofit *Pseudomonas* kelompok pendar terhadap pertumbuhan tanaman jagung.

Penelitian dilaksanakan mulai bulan September sampai Desember 2022, bertempat di Laboratorium Perlindungan Tanaman dan *screen house* Fakultas Pertanian Universitas Jenderal Soedirman, Purwokerto. Rancangan penelitian yang digunakan yaitu Rancangan Acak Kelompok (RAK) dengan perlakuan bakteri endofit *Pseudomonas* spp. pendar Padamara A1, *Pseudomonas* spp. pendar Karangreja B4, dan *Pseudomonas putida* Padamara B5. Variabel yang diamati yaitu masa inkubasi penyakit, intensitas penyakit, nilai efektivitas pengendalian, *Area Under Disease Progress Curve* (AUDPC), uji fenol, serta komponen pertumbuhan tanaman. Data dianalisis menggunakan analisis ragam (ANOVA) dan apabila terdapat pengaruh yang nyata antar perlakuan, maka dilanjutkan dengan uji Beda Nyata Terkecil pada taraf kesalahan 5%.

Hasil penelitian menunjukkan bahwa ketiga isolat *Pseudomonas* spp. kelompok pendar belum efektif untuk mengendalikan penyakit bulai pada tanaman jagung manis. Walaupun demikian, *Pseudomonas* spp. pendar Padamara A1 memberikan pengaruh terbaik dalam mengendalikan penyakit bulai dengan menunda masa inkubasi sebesar 73,73%, menekan intensitas penyakit sebesar 45%, menekan nilai AUDPC sebesar 53,50%, dan memiliki nilai efektivitas sebesar 40,98%. Ketahanan tanaman jagung manis terhadap penyakit bulai didukung oleh meningkatnya kandungan fenol (saponin) pada perlakuan bakteri endofit *Pseudomonas* pendar Karangreja B4 dan *P. putida* Padamara B5. Aplikasi bakteri endofit *P. putida* Padamara B5 menunjukkan pengaruh terbaik pada pertumbuhan tanaman jagung manis dalam meningkatkan tinggi tanaman sebesar 31,3%, jumlah daun sebesar 16,17%, bobot segar akar sebesar 37,8%, dan bobot segar tanaman sebesar 27,61%.

SUMMARY

Sweet corn is an important food crop after rice as a source of carbohydrates and protein in the needs of the Indonesian people. However, sweet corn production experienced a decline in production quality due to plant pest organisms (PPO). One of the PPO that attack is the pathogenic fungus *Peronosclerospora maydis* which causes downy mildew. Efforts to control this disease generally use chemical pesticides that can harm the environment and humans. Therefore, it is necessary to carry out alternative control, namely biologically using antagonistic bacteria originating from plant tissue or called endophytic bacteria. Endophytic bacteria that can be used as biological agents are fluorescent *Pseudomonas* spp. This study aims to 1) Determine the potential of endophytic bacteria fluorescent *Pseudomonas* spp. in controlling downy mildew disease in corn plants, 2) To determine the effect of inducing resistance of sweet corn plants by endophytic bacteria fluorescent *Pseudomonas* spp. on downy mildew disease, 3) To determine the effect of application of endophytic bacteria fluorescent *Pseudomonas* spp. on the growth of corn plants.

The research was carried out from September to December 2022, taking place at the Plant Protection Laboratory and screen house at the Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. The research design used was the Randomized Block Design (RBD) with the treatment of endophytic bacteria fluorescent *Pseudomonas* spp. Padamara A1, fluorescent *Pseudomonas* spp. Karangreja B4, and *Pseudomonas putida* Padamara B5. The variables observed were disease incubation period, disease intensity and control effectiveness, Area Under Disease Progress Curve (AUDPC), phenol tests, and plant growth components. Data were analyzed using analysis of variance (ANOVA) and if there were significant differences between treatments, then it was continued with the Least Significant Difference test at an error level of 5%.

The results showed that the three isolates of fluorescent *Pseudomonas* spp. has not been effective for controlling downy mildew in sweet corn. However, fluorescent *Pseudomonas* spp. Padamara A1 gives the best effect in controlling downy mildew by delaying the incubation period by 73,73%, reducing disease intensity by 45%, reducing the AUDPC value by 53,5%, and having an effectiveness value of 40,98%. The resistance of sweet corn plants to downy mildew disease was supported by the increased content of phenol (saponin), in the treatment of fluorescent *Pseudomonas* Karangreja B4 and *P. putida* Padamara B5. The application of the endophytic bacteria *P. putida* Padamara B5 had the best effect on the growth of sweet corn plants in increasing plant height by 31,3%, number of leaves by 16,17%, root fresh weight by 37,8%, and plant fresh weight by 27,61%.