

RINGKASAN

Pisang merupakan salah satu tanaman hortikultura yang banyak dibudidayakan di Indonesia. Permintaan pasar akan buah pisang baik dari domestik hingga ekspor ke luar negeri selalu tinggi. Akan tetapi, Indonesia belum mampu memenuhi seluruh permintaan tersebut dikarenakan budidaya pisang di Indonesia yang cukup sulit dilakukan hingga panen akibat adanya serangan penyakit layu *Fusarium*. Diperlukan adanya pengendalian sejak dini untuk mencegah kerugian akibat penyakit layu *Fusarium* salah satunya dengan penggunaan jamur endofit. Jamur endofit mampu berperan sebagai agen hayati ramah lingkungan yang dapat mengendalikan serangan OPT khususnya patogen jamur *Fusarium*.

Penelitian ini bertujuan untuk mengkaji pengaruh pengimbasan tiga jenis jamur endofit, yaitu *Aspergillus* sp., *Penicillium* sp., dan *Gliocladium* sp., terhadap ketahanan fisiologis dan biokimia dua varietas tanaman pisang (Kepok dan Cavendish) terhadap penyakit layu *Fusarium* yang disebabkan oleh *Fusarium oxysporum* f.sp. *cubense* (Foc). Penelitian dilaksanakan di Screenhouse dan Laboratorium Perlindungan Tanaman, Universitas Jenderal Soedirman, pada bulan Oktober 2024 hingga bulan Juli 2025 menggunakan Rancangan Acak Lengkap dua faktorial dengan lima perlakuan dan dua varietas, masing-masing diulang lima kali. Parameter yang diamati meliputi tinggi tanaman, intensitas penyakit, nilai AUDPC, dan kandungan senyawa biokimia seperti fenol, tanin, gula, karbohidrat, klorofil, enzim peroksidase, dan saponin.

Hasil penelitian menunjukkan bahwa ketiga jamur endofit mampu menginduksi ketahanan fisiologis tanaman pisang terhadap cekaman patogen *Fusarium*. Jamur endofit *Aspergillus* sp. dan *Penicillium* sp. mampu menginduksi ketahanan tanaman yang ditunjukkan oleh kandungan klorofil yang lebih tinggi dibandingkan endofit lainnya. Sedangkan jamur endofit *Penicillium* sp. dan *Gliocladium* sp. mampu menginduksi ketahanan fisiologis tanaman pisang yang ditandai oleh peningkatan senyawa karbohidrat dan gula. Sementara itu, pada analisis terhadap aktivitas biokimia tanaman, ketiga jamur endofit mampu menginduksi ketahanan yang ditandai dengan peningkatan aktivitas senyawa

metabolit sekunder seperti kandungan fenol (*Aspergillus* sp. dan *Gliocladium* sp.), enzim peroksidase (*Penicillium* sp. dan *Gliocladium* sp.), tanin (Ketiga jamur endofit), serta saponin (*Penicillium* sp.).



SUMMARY

Bananas are one of the horticultural crops widely cultivated in Indonesia. Market demand for bananas, both domestically and for export, remains consistently high. However, Indonesia has not yet been able to fully meet this demand due to the challenges in banana cultivation, particularly up to the harvest stage, caused by the attack of Fusarium wilt disease. Early control measures are necessary to prevent losses due to Fusarium wilt, one of which is the use of endophytic fungi. Endophytic fungi can serve as environmentally friendly biological control agents capable of managing pest and disease attacks, particularly the fungal pathogen Fusarium.

This research aims to examine the effects of inoculation with three types of endophytic fungi—Aspergillus sp., Penicillium sp., and Gliocladium sp.—on the physiological and biochemical resistance of two banana varieties (Kepok and Cavendish) against Fusarium wilt disease caused by Fusarium oxysporum f.sp. cubense (Foc). The research was conducted in a screenhouse and in the Plant Protection Laboratory at Universitas Jenderal Soedirman from October 2024 to July 2025, using a factorial Completely Randomized Design with five treatments and two varieties, each repeated five times. The observed parameters included plant height, disease intensity, AUDPC value, and biochemical compound contents such as phenols, tannins, sugars, carbohydrates, chlorophyll, peroxidase enzyme, and saponins.

The results of the study showed that the three endophytic fungi were able to induce the physiological resistance of banana plants against Fusarium pathogen stress. The endophytic fungi Aspergillus sp. and Penicillium sp. were able to induce plant resistance as indicated by higher chlorophyll content compared to the other endophytes. Meanwhile, Penicillium sp. and Gliocladium sp. were able to induce the physiological resistance of banana plants, as evidenced by the increase in starch and sugar compounds. Furthermore, in the analysis of the biochemical activity of the plants, all three endophytic fungi were able to induce resistance, which was characterized by an increase in the activity of secondary metabolites such as phenolic content (Aspergillus sp. and Gliocladium sp.), peroxidase enzymes

(Penicillium sp. and Gliocladium sp.), tannins (all three endophytic fungi), and saponins (Penicillium sp.)

