

RINGKASAN

Patogen penyebab penyakit pada tanaman menjadi suatu permasalahan serius bagi pertanian di berbagai wilayah. Patogen tanaman dapat berupa bakteri, virus, nematoda, dan juga fungi. *Fusarium* khususnya *F. oxysporum* merupakan fungi yang dikenal mampu menyebabkan layu dan busuk batang serta termasuk ke dalam sepuluh besar patogen berdasarkan kepentingan ilmiah dan ekonomi dalam patologi tanaman. Strategi pengendalian penyakit yang dapat dilakukan salah satunya dengan menggunakan agensia hayati yang mampu menjadi agensia biokontrol. Agensia biokontrol dapat ditemukan di berbagai habitat termasuk tanah rizosfer. Tanah rizosfer termasuk pada tanaman damar (*Agathis dammara*) mengandung populasi mikroba yang lebih besar apabila dibandingkan dengan tanah non rizosfer, termasuk di dalamnya fungi antagonis yang dapat menjadi agensia biokontrol. Tujuan penelitian ini adalah untuk mengetahui fungi apa saja yang diperoleh dari hasil isolasi rizosfer tanaman damar Kebun Raya Baturraden dan mengetahui potensi fungi rizosfer tanaman damar dalam menekan pertumbuhan fungi patogen.

Penelitian ini menggunakan metode survei dan eksperimental. Metode survei digunakan untuk mendapatkan isolat fungi dengan cara mengisolasi tanah rizosfer tanaman Damar dengan teknik random sampling pada 3 titik kemudian dikarakterisasi dan diidentifikasi. Isolat yang diperoleh selanjutnya dilakukan uji antagonisme berdasarkan *dual culture* dan uji aktivitas senyawa volatil terhadap fungi patogen dengan metode eksperimental menggunakan Rancangan Acak Lengkap (RAL) dengan 3 ulangan. Data dianalisis menggunakan analisis ragam/*Analysis of Variance* (ANOVA). Hasil ANOVA menunjukkan signifikansi diuji lanjut dengan *Duncan Multiple Range Test* (DMRT) pada taraf kepercayaan 95%.

Hasil dari isolasi fungi rizosfer tanaman damar Kebun Raya Baturraden diperoleh 10 isolat yang dikelompokkan ke dalam 3 genera yaitu *Gliocladium*, *Aspergillus*, dan *Trichoderma*. Fungi rizosfer yang diperoleh dari hasil isolasi menunjukkan kemampuan dalam menghambat pertumbuhan patogen *F. oxysporum*. Kemampuan penghambatan pertumbuhan patogen *F. oxysporum* berdasarkan uji antagonisme dengan metode *dual culture* menunjukkan isolat *Trichoderma* sp.3 (I7A3) memiliki nilai penghambatan paling baik, sedangkan berdasarkan uji aktivitas senyawa volatil isolat *Trichoderma* sp.3 (I7A1) menunjukkan nilai penghambatan paling baik.

Kata kunci: *biokontrol, damar, fungi, Fusarium oxysporum, rizosfer.*

SUMMARY

Pathogens that cause disease in plants are a serious problem for agriculture in various regions. Plant pathogens can be bacteria, viruses, nematodes, and also fungi. *Fusarium*, especially *F. oxysporum*, is a known fungus capable of causing wilt and stem rot and is included in the top ten pathogens based on scientific and economic importance in plant pathology. One of the disease control strategies that can be done is by using biological control or by using biological agents that are able to become biocontrol agents. Biocontrol agents can be found in various habitats including rhizosphere soil. Rhizosphere soil contains a larger microbial population when compared to non-rhizosphere soil, including antagonistic fungi that can become biocontrol agents. Exudates in the plant rhizosphere are present in all plant root systems, including the root system of resin plants. The purpose of this study was to determine what fungi were obtained from the isolation of resin plant rhizosphere of Baturraden Botanical Garden and to determine the potential of resin plant rhizosphere fungi in suppressing the growth of pathogenic fungi.

This study used survey and experimental methods. The survey method is used to obtain fungal isolates by isolating the rhizosphere soil of Damar plants with random sampling techniques at 3 points then characterized and identified. The isolates obtained will then be tested for antagonism based on dual culture and volatile compound activity tests against pathogenic fungi with experimental methods using a Completely Randomized Design (CRD) with 3 replications. Data were analyzed using analysis of variance (ANOVA). ANOVA results showed significance were further tested with Duncan Multiple Range Test (DMRT) at 95% confidence level.

The results of the isolation of rhizosphere fungi of damar plants in Baturraden Botanical Garden obtained 10 isolates grouped into 3 genera namely *Gliocladium*, *Aspergillus*, and *Trichoderma*. The rhizosphere fungi obtained from the isolation results showed the ability to inhibit the growth of the pathogen *F. oxysporum*. The ability to inhibit the growth of the pathogen *F. oxysporum* based on the antagonism test with the dual culture method showed that the isolate *Trichoderma* sp.3 (I7A3) had the best value. Meanwhile, based on the volatile compound activity test, the isolate *Trichoderma* sp.3 (I7A1) showed the best inhibition value.

Keywords : *biocontrol, damar, fungi, Fusarium oxysporum, rhizosphere.*