RINGKASAN

Fusarium oxysporum merupakan patogen penyebab layu batang pada berbagai jenis tumbuhan. Patogen ini dapat dikendalikan melalui beberapa metode seperti solarisasi tanah, rotasi tanaman, perbaikan drainase, dan penggunaan bahan kimia berupa fungisida. Umumnya para petani menggunakan fungisida sebagai pengendalian patogen tersebut, namun pengendalian secara kimiawi belum dapat menjadi solusi yang efektif, penggunaan bahan kimia dalam jumlah besar dan terus menerus dapat mengganggu keseimbangan makhluk hidup ataupun lingkungan di sekitarnya. Pendekatan potensial pengendalian *F. oxysporum.* baru-baru ini ditemukan berupa pemanfaatan agen biologis salah satunya fungi, seperti *Trichoderma* sp., *Gliocladium* sp., dan *Aspergillus* sp.. yang bersifat antagonis terhadap *F. oxysporum*. Fungi dapat hidup di berbagai lingkungan, salah satunya tanah rizosfer atau tanah daerah perakaran tanaman. Eksplorasi dan pemanfaatan fungi antagonis dari tanah rizosfer dapat menjadi potensi yang baik untuk pengendalian *F. oxsysporum.*. Penelitian ini bertujuan untuk menemukan keberagaman fungi potensial pada tanah rizosfer tanaman *Agathis dammara* di Kebun Raya Baturraden dan mengetahui bagaimana kemampuan fungi tersebut dalam menghambat pertumbuhan fungi patogen *F. oxysporum.*

Penelitian ini dilakukan menggunakan dua metode yaitu metode survey dan metode eksperimental. Metode survey digunakan pada saat *sampling* dengan teknik purposive random *sampling* dalam mengambil sampel tanah perakaran tanaman damar untuk diisolasi, isolat jamur yang didapat dari hasil isolasi dikarakterisasi dan identifikasi, sedangkan metode eksperimental dilakukan pada uji antagonis. Isolat fungi yang didapat akan diuji antagonis dengan *F. oxysporum.* secara *in-vitro* menggunakan metode kultur ganda dan metode *non-volatil*. Variabel yang digunakan untuk uji antagonis adalah persentase daya hambat fungi hasil isolasi terhadap patogen *F. o*xysporum. Parameter yang diamati berupa diameter koloni *F. oxysporum.*, persentase daya hambat, dan mekanisme yang terjadi saat uji *dual culture* yaitu mekanisme kompetisi, mekanisme parasitisme, dan mekanisme antibiosis. Nilai persentase hambat dari dua uji antagonis yang telah dilakukan dianalisis menggunakan *Analysis of Variance* (ANOVA) dengan taraf kepercayaan 95%. Kemudian hasil ANOVA dianalisis menggunakan uji lanjut *Duncan Multiple Range Test* (DMRT) pada taraf kepercayaan 95%.

Karakterisasi dan identifikasi yang mengacu pada buku *Compendium of Soil Fungi* menununjukkan 5 dari 7 isolat hasil isolasi rizosfer *A. dammara* di Kebun Raya Baturraden teridentifikasi sebagai *Penicillium* sp., *Trichoderma* sp., dan *Aspergillus* sp.. Hasil uji kultur ganda dan *non volatil* menunjukkan jamur hasil isolasi bersifat antagonis terhadap jamur patogen *F. oxysporum.* dengan rata-rata persentase hambat berturut-turut yaitu 41,74%-90,07% dan 78,18%-89,38%.

Kata kunci: *Eksplorasi, fungi antagonis, Fusarium oxysporum, non-volatil,* rizosfer

SUMMARY

Fusarium oxysporum is a pathogen that causes stem wilt in various types of plants. This pathogen can be controlled through several methods such as soil solarization, crop rotation, drainage improvement, and the use of chemicals in the form of fungicides. Generally, farmers use fungicides to control the pathogen, but chemical control has not been an effective solution, the use of chemicals in large quantities and continuously can disrupt the balance of living things or the surrounding environment. A potential approach to controlling *F. oxysporum.* has recently been discovered in the form of utilizing biological agents, one of which is fungi, such as *Trichoderma* sp., *Gliocladium* sp., and *Aspergillus* sp.. which are antagonistic to *F. oxysporum.* Fungi can live in various environments, one of which is rhizosphere soil or soil in the root area of plants. Exploration and utilization of antagonistic fungi from rhizosphere soil can be a good potential for controlling *F. oxsysporum..* This study aims to find the diversity of potential fungi in the rhizosphere soil of *Agathis dammara* plants in the Baturraden Botanical Gardens and to determine the ability of these fungi to inhibit the growth of the pathogenic fungus *F. oxysporum.*

This study was conducted using two methods, the survey method and the experimental method. Survey method was used during sampling with a purposive random sampling technique in taking samples of damar plant root soil for isolation, fungal isolates obtained from the isolation results were characterized and identified, while the experimental method was carried out on antagonist tests. The fungal isolates obtained will be tested antagonistically with *F. oxysporum.* in-vitro using the dual culture method and the non-volatile method. The variables used for the antagonist test are the percentage of the inhibitory power of the isolated fungi against the pathogen *F. oxysporum.* The parameters observed were the diameter of the *F. oxysporum* colony, the percentage of inhibition, and the mechanisms that occurred during the dual culture test, namely the competition mechanism, the parasitism mechanism, and the antibiosis mechanism. The percentage inhibition values from the two antagonist tests that had been carried out were analyzed using Analysis of Variance (ANOVA) with a confidence level of 95%. Then the ANOVA results were analyzed using the Duncan Multiple Range Test (DMRT) further test at a confidence level of 95%.

Characterization and identification referring to the Compendium of Soil Fungi book showed that 5 out of 7 isolates from the rhizosphere of *A. dammara* in the Baturraden Botanical Garden were identified as *Penicillium* sp., *Trichoderma* sp., and *Aspergillus* sp. The results of the dual culture and non-volatile tests showed that the isolated fungi were antagonistic to the pathogenic fungus *F. oxysporum.* with an average percentage of inhibition of 41.74%-90.07% and 78.18%-89.38%, respectively.

Keywords: *Antagonistic fungi, exploration, Fusarium oxysporum, non-volatile, rizosphere*