

ABSTRAK

EKSPLORASI JAMUR ASAL RIZOSFER PADI ANORGANIK UNTUK MENGENDALIKAN *Sarocladium oryzae* dan POTENSINYA DALAM MEMACU PERTUMBUHAN TANAMAN

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Penyakit busuk pelepah yang disebabkan oleh jamur *Sarocladium oryzae* merupakan salah satu patogen utama padi karena dapat menurunkan produktivitas tanaman. Pengendalian menggunakan pestisida sintesis berpotensi menimbulkan dampak negatif terhadap lingkungan, sehingga diperlukan alternatif pengendalian yang lebih ramah lingkungan. Penelitian ini bertujuan untuk mendapatkan jamur asal rizosfer tanaman padi anorganik yang berpotensi sebagai agen pengendali hayati serta mengetahui kemampuannya sebagai *Plant Growth Promoting Fungi* (PGPF). Penelitian dilaksanakan melalui beberapa tahapan, meliputi eksplorasi dan isolasi jamur rizosfer, uji hipovirulensi, uji antagonis dengan metode kultur ganda (*dual culture*), pengamatan *slide culture*, senyawa volatil, serta uji potensi sebagai PGPF pada tanaman mentimun. Hasil eksplorasi diperoleh sebanyak 27 isolat jamur rizosfer dari tiga lokasi berbeda, sebanyak 21 isolat dikategorikan sebagai hipovirulen. Hasil uji antagonis metode *dual culture* menunjukkan isolat L2P1(1) memiliki persentase penghambatan tertinggi mencapai 60,29% termasuk dalam genus *Aspergillus* sp., sedangkan pada uji volatil isolat L3P2(1) menunjukkan penghambatan mencapai sebesar 70,24% termasuk dalam genus *Penicillium* sp. Pengamatan interaksi pada uji *Slide culture* menunjukkan adanya kontak langsung antara hifa jamur antagonis dan patogen. Beberapa isolat juga diketahui berperan sebagai PGPF yang berpotensi meningkatkan pertumbuhan tanaman berdasarkan peningkatan variabel tinggi tanaman, jumlah daun, berat basah, dan berat kering tanaman. Hasil identifikasi morfologi menunjukkan bahwa isolat yang diperoleh didominasi oleh genus *Penicillium*, serta beberapa isolat dari genus *Aspergillus* dan *Trichoderma*. Hasil penelitian ini menunjukkan bahwa jamur rizosfer padi anorganik berpotensi sebagai agen pengendali hayati sekaligus pemacu pertumbuhan tanaman.

Kata kunci: jamur antagonis, pengendalian hayati, PGPF, rizosfer padi,
Sarocladium oryzae.

ABSTRACT

EXPLORATION OF FUNGI ISOLATED FROM THE RHIZOSPHERE OF INORGANIC RICE FIELDS FOR THE CONTROL OF *Sarocladium oryzae* AND THEIR POTENTIAL TO PROMOTE PLANT GROWTH

By

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Sheath rot disease caused by *Sarocladium oryzae* is one of the major diseases of rice because it can significantly reduce crop productivity. The use of synthetic pesticides for disease management may have adverse environmental impacts; therefore, environmentally friendly alternatives are needed. This study aimed to obtain fungal isolates from the rhizosphere of rice grown under inorganic cultivation that have potential as biological control agents and to evaluate their ability as Plant Growth-Promoting Fungi (PGPF). The research consisted of several stages, including the exploration and isolation of rhizosphere fungi, hypovirulence testing, antagonistic assays using the dual culture method, slide culture observations, volatile compound assays, and evaluation of PGPF potential using cucumber plants as indicator plants. A total of 27 rhizosphere fungal isolates were obtained from three different locations, of which 21 isolates were classified as hypovirulent. The dual culture assay showed that isolate L2P1(1), identified as *Aspergillus* sp., exhibited the highest inhibition percentage of 60.29%. In the volatile compound assay, isolate L3P2(1), identified as *Penicillium* sp., produced the highest inhibition percentage of 70.24%. Slide culture observations revealed direct interactions between the hyphae of the antagonistic fungi and the pathogen. Several isolates also functioned as PGPF, promoting plant growth as indicated by increased plant height, number of leaves, fresh weight, and dry weight. Morphological identification showed that the fungal isolates were predominantly members of the genus *Penicillium*, with several isolates belonging to the genera *Aspergillus* and *Trichoderma*. These findings indicate that fungi isolated from the rhizosphere of inorganic rice fields have the potential to serve as biological control agents while simultaneously promoting plant growth.

Keywords: antagonistic fungi, biological control, Plant Growth-Promoting Fungi (PGPF), rice rhizosphere, *Sarocladium oryzae*.