

INTISARI

Jeruk (*Citrus* sp.) merupakan salah satu komoditas hortikultura penting di Indonesia. Organisme Pengganggu Tumbuhan (OPT) merupakan faktor yang menjadi kendala dalam budidaya jeruk khususnya penyakit antraknosa yang disebabkan oleh *Colletotrichum* sp. yang berdampak pada penurunan produksi jeruk. Diperlukan pengendalian ramah lingkungan ditengah isu pestisida yang telah menjadi permasalahan kerusakan lingkungan. Salah satu upaya pengendalian alternatif yang dapat dilakukan yaitu dengan memanfaatkan agens hayati berupa bakteri endofit. Penelitian ini bertujuan untuk mengetahui potensi antagonisme bakteri endofit dalam menekan jamur patogen *Colletotrichum* sp., mengidentifikasi spesies bakteri endofit yang berpotensi sebagai agens biokontrol dan mengidentifikasi gen-gen penyandi antibiotik yang terdapat pada bakteri endofit. Penelitian ini dilakukan pada 10 isolat bakteri endofit asal tanaman jeruk terhadap jamur *Colletotrichum* sp.. Pengujian antagonis dilakukan secara *in vitro* dengan metode *dual culture*. Identifikasi spesies bakteri endofit menggunakan primer universal *gyrB* dan dilanjutkan *sequencing*. Deteksi gen-gen penyandi antibiotik, seperti fengycin, bacillomycin D dan iturin A menggunakan primer spesifik. Berdasarkan hasil pengujian antagonis bakteri endofit didapatkan isolat SH-1, SH-2, SH-3, BYL-1, BYL-2, M2, dan P4 yang mampu menghambat pertumbuhan jamur patogen *Colletotrichum* sp.. Identifikasi spesies bakteri endofit dilakukan terhadap isolat SH-1 yang memiliki daya penghambatan tertinggi sebesar 64,81%. Berdasarkan hasil analisis molekuler isolat SH-1 memiliki kemiripan dengan *Bacillus velezensis*. Pengujian gen penyandi antibiotik menghasilkan seluruh isolat mampu mengamplifikasi gen fengycin, bacillomycin D dan iturin A.

Kata kunci: Antibiotik, *Bacillus velezensis*, bakteri endofit, *Colletotrichum* sp., Jeruk

ABSTRACT

Citrus (*Citrus* sp.) is one of the important horticultural commodities in Indonesia. Plant Disturbing Organisms (PESTs) are factors that become a barrier in citrus cultivation, especially anthracnose disease caused by *Colletotrichum* sp. which has an impact on reducing citrus production. Environmentally friendly control is needed amid the issue of pesticides that have become a problem of environmental damage. One of the alternative control efforts that can be done is by utilizing biological agents in the form of endophytic bacteria. This study aims to determine the antagonistic potential of endophytic bacteria in suppressing the pathogenic fungus *Colletotrichum* sp., identify endophytic bacterial species that have potential as biocontrol agents and identify antibiotic encoding genes contained in endophytic bacteria. This study was conducted on 10 isolates of endophytic bacteria from citrus plants against *Colletotrichum* sp. fungus. Antagonist testing was done in vitro with dual culture method. Identification of endophytic bacterial species using universal primer *gyrB* and continued sequencing. Detection of antibiotic encoding genes, such as fengycin, bacillomycin D and iturin A using specific primers. Based on the results of antagonistic testing of endophytic bacteria, isolates SH-1, SH-2, SH-3, BYL-1, BYL-2, M2, and P4 were obtained which were able to inhibit the growth of pathogenic fungi *Colletotrichum* sp.. Identification of endophytic bacterial species was carried out on isolate SH-1 which had the highest inhibitory power of 64.81%. Based on the results of molecular analysis, isolate SH-1 has similarities with *Bacillus velezensis*. Antibiotic encoding gene testing resulted in all isolates being able to amplify fengycin, bacillomycin D and iturin genes.

Keywords: Antibiotics, *Bacillus velezensis*, endophytic bacteria, *Colletotrichum* sp., Citrus