

ABSTRAK

Penyakit tanaman yang disebabkan oleh cendawan patogen seperti *Sclerotium* sp., *Colletotrichum* sp., dan *Fusarium* sp. menjadi tantangan besar dalam budidaya pertanian karena dapat menurunkan produktivitas dan kualitas hasil panen. Penggunaan pestisida sintetis yang berlebihan menimbulkan dampak negatif sehingga diperlukan alternatif pengendalian hayati, salah satunya dengan memanfaatkan bakteri antagonis *Bacillus* spp.. Penelitian ini bertujuan untuk menguji potensi isolat *Bacillus* spp. KJ275231 yang berasal dari dadiah Kerinci sebagai agen pengendali hayati terhadap tiga jenis cendawan patogen tanaman secara *in vitro*. Penelitian dilaksanakan di Laboratorium Penyakit Tanaman Fakultas Pertanian Universitas Jambi menggunakan metode *dual culture* untuk mengamati aktivitas antagonistik melalui pembentukan zona hambat. Hasil penelitian menunjukkan bahwa isolat *Bacillus* spp. KJ275231 mampu menghambat pertumbuhan *Sclerotium* sp. sebesar 36%, *Fusarium* sp. sebesar 24,04%, dan *Colletotrichum* sp. sebesar 19,56%. Meskipun daya hambat tergolong sedang hingga rendah, aktivitas ini menunjukkan potensi biokontrol melalui mekanisme antibiosis, produksi enzim litik, serta kompetisi ruang dan nutrisi. Temuan ini memperkuat prospek penggunaan *Bacillus* spp. KJ275231 sebagai agen pengendalian hayati dalam mendukung sistem pertanian berkelanjutan.

Kata kunci : *Bacillus* spp. KJ275231, cendawan patogen, pengendalian hayati, antagonisme, dual culture

ABSTRACT

Plant diseases caused by pathogenic fungi such as Sclerotium sp., Colletotrichum sp., and Fusarium sp. become a big challenge in agricultural cultivation because it can reduce productivity and quality of crops. Excessive use of synthetic pesticides has a negative impact so that alternative biological control is needed, one of which is by utilizing Bacillus spp. antagonistic bacteria. This study aims to test the potential of Bacillus spp. isolate KJ275231 derived from Kerinci dadiah as a biological control agent against three types of fungal plant pathogens in vitro. The research was conducted at Plant Disease Laboratory, Faculty of Agriculture, Jambi University using dual culture method to observe antagonistic activity through the formation of inhibition zone. The results showed that Bacillus spp. isolate KJ275231 was able to inhibit the growth of Sclerotium sp. by 36%, Fusarium sp. by 24.04%, and Colletotrichum sp. by 19.56%. Although the inhibition was moderate to low, this activity showed biocontrol potential through the mechanisms of antibiosis, lytic enzyme production, and competition for space and nutrients. These findings strengthen the prospect of using Bacillus spp. KJ275231 as a biological control agent in supporting sustainable agricultural systems.

Keywords: *Bacillus spp. KJ275231, pathogenic fungi, biological control, antagonism, dual culture*