RINGKASAN

Cabai merah (*Capsicum annum*) merupakan komoditas tanaman yang memiliki nilai ekonomi tinggi. Salah satu faktor yang mempengaruhi produksi cabai merah adalah penyakit antraknosa yang disebabkan oleh jamur *Colletotrichum* sp. Pengendalian penyakit antraknosa dapat dilakukan dengan memanfaatkan bakteri endofit yang bersifat antagonis terhadap jamur *Colletotrichum* sp. Penelitian sebelumnya menunjukkan bahwa bakteri endofit yang diisolasi dari akar cabai mampu menghambat pertumbuhan jamur *Colletotrichum* sp., namun belum ada penelitian mengenai bakteri endofit dari daun dan batang tanaman cabai yang mampu menghambat pertumbuhan jamur *Colletotrichum* sp. Penelitian ini bertujuan untuk mengisolasi, menguji, dan mengidentifikasi bakteri endofit dari tanaman cabai yang mampu menghambat pertumbuhan jamur *Colletotrichum* sp.

Penelitian dilakukan di Laboratorium Mikrobiologi PT Biotek Cipta Kreasi dan Laboratorium Mikrobiologi Fakultas Biologi Universitas Jenderal Soedirman dengan metode survei. Bakteri endofit diisolasi dari jaringan daun dan batang tanaman cabai yang sehat. Pengujian isolat bakteri endofit terhadap jamur *Colletotrichum* sp. dilakukan dengan metode konfrontasi ganda. Uji antijamur dilakukan menggunakan filtrat dan ekstrak metabolit sekunder bakteri endofit. Isolat bakteri endofit yang mampu menghambat pertumbuhan *Colletotrichum* sp. diidentifikasi melalui karakterisasi morfologi bakteri, sifat biokimia, sifat fisiologi, dan penggunaan karbohidrat sebagai satu-satunya sumber karbon. Data yang diperoleh dianalisis secara deskriptif dan identifikasi isolat bakteri mengacu pada buku *Bergey's Manual of Determinative Bacteriology.*

Hasil penelitian ini didapatkan bakteri endofit sebanyak 7 isolat yang terdiri atas 5 isolat bakteri endofit asal daun tanaman cabai (DC1, DC2, DC3, DC4 , dan DC5) dan 2 isolat bakteri endofit asal batang tanaman cabai (BC1 dan BC2). Isolat bakteri endofit DC1 dan BC2 mampu menghambat pertumbuhan jamur *Colletotrichum* sp. pada media *potato dextrose agar*. Filtrat dan ekstrak metabolit sekunder isolat DC1 dan BC2 tidak mampu menghambat pertumbuhan jamur *Colletotrichum* sp. Isolat bakteri endofit DC1 dan BC2 penghambat pertumbuhan jamur *Colletotrichum* sp. diidentifikasi sebagai spesies anggota genus *Bacillus.*

Kata kunci: *Antagonis, antraknosa, bakteri endofit, cabai merah, Colletotrichum sp.*

SUMMARY

Red chili (*Capsicum annum*) is a plant commodity that has high economic value. One of the factors affecting red chili production is anthracnose disease caused by the fungus *Colletotrichum* sp. Control of anthracnose disease can be done by utilizing endophytic bacteria which are antagonistic to the fungus *Colletotrichum* sp. Previous research showed that endophytic bacteria isolated from chili roots were able to inhibit the growth of *Colletotrichum* sp. This study aims to isolate, test, and identify endophytic bacteria from chili plants that are able to inhibit the growth of the fungus *Colletotrichum* sp.

The research was conducted at the Microbiology Laboratory of PT Biotek Cipta Kreasi and the Microbiology Laboratory of the Faculty of Biology, Jenderal Soedirman University using a survey method. Endophytic bacteria were isolated from the leaves and stems of healthy chili plants. Testing of endophytic bacterial isolates against the fungus *Colletotrichum* sp. carried out using the double confrontation method. The antifungal test was carried out using filtrate and extracts of secondary metabolites of endophytic bacteria. Endophytic bacterial isolates capable of inhibiting the growth of *Colletotrichum* sp. identified through characterization of bacterial morphology, biochemical properties, physiological properties, and the use of carbohydrates as the only carbon source. The data obtained were analyzed descriptively and identification of bacterial isolates referred to Bergey's Manual of Determinative Bacteriology.

The results of this study obtained 7 isolates of endophytic bacteria consisting of 5 isolates of endophytic bacteria from the leaves of chili plants (DC1, DC2, DC3, DC4, and DC5) and 2 isolates of endophytic bacteria from chili plant stems (BC1 and BC2). Endophytic bacterial isolates DC1 and BC2 were able to inhibit the growth of the fungus *Colletotrichum* sp. on potato dextrose agar media. Filtrate and secondary metabolite extracts isolates DC1 and BC2 were not able to inhibit the growth of the fungus *Colletotrichum* sp. *Endophytic* bacterial isolates DC1 and BC2 inhibiting the growth of the fungus *Colletotrichum* sp. identified as a species member of the genus *Bacillus*.

Key words: Antagonists, anthracnose, *Colletotrichum* sp., endophytic bacteria, red chili.