

RINGKASAN

Actinomycetes termasuk kelompok bakteri Gram positif dan bersifat aerob. *Actinomycetes* dikenal memiliki potensi yang sangat baik sebagai agen pengendali hayati karena kemampuannya dalam menghasilkan metabolit sekunder yang mampu menghambat pertumbuhan patogen. *Actinomycetes* diketahui mampu menghasilkan antifungi yang dapat menghambat pertumbuhan jamur patogen seperti *Fusarium* sp. dan *Colletotrichum* sp. *Actinomycetes* dapat diisolasi dari berbagai sumber alami, salah satunya dari limbah bekas maggot. Penelitian ini bertujuan untuk mengetahui kemampuan penghambatan isolat *Actinomycetes* terhadap pertumbuhan jamur patogen *Fusarium* sp. dan *Colletotrichum* sp., mengetahui kemampuan penghambatan metabolit sekunder isolat *Actinomycetes* terhadap pertumbuhan jamur patogen *Fusarium* sp. dan *Colletotrichum* sp., dan mengetahui karakteristik isolat *Actinomycetes* yang mampu menghambat pertumbuhan kedua patogen tersebut.

Penelitian dilakukan menggunakan metode survei di Laboratorium Mikrobiologi PT Biotek Cipta Kreasi dan Laboratorium Mikrobiologi Fakultas Biologi Universitas Jenderal Soedirman. Tahap penelitian meliputi pengambilan sampel limbah bekas maggot, isolasi dan pemurnian isolat *Actinomycetes*, rekultur isolat *Actinomycetes*, uji antagonis isolat *Actinomycetes* terhadap jamur patogen *Fusarium* sp. dan *Colletotrichum* sp., isolasi senyawa metabolit sekunder isolat *Actinomycetes* terpilih, penghitungan kerapatan spora jamur patogen, uji aktivitas antifungi ekstrak kasar isolat *Actinomycetes* terpilih terhadap jamur patogen, uji aktivitas antifungi supernatan kasar isolat *Actinomycetes* terpilih terhadap jamur patogen, pembuatan kurva pertumbuhan isolat *Actinomycetes* terpilih, produksi kitinase isolat *Actinomycetes* terpilih, uji aktivitas kitinolitik isolat *Actinomycetes* terpilih, dan karakterisasi isolat *Actinomycetes* terpilih. Data yang diperoleh dianalisis secara deskriptif.

Hasil penelitian diperoleh sebanyak dua isolat *Actinomycetes* (BM1 dan BM2) dari limbah bekas maggot. Berdasarkan penelitian yang telah dilakukan, diketahui bahwa isolat BM2 mampu menghambat pertumbuhan jamur patogen *Fusarium* sp. dan *Colletotrichum* sp. Metabolit sekunder yang dihasilkan isolat BM2 tidak dapat menghambat pertumbuhan jamur patogen *Fusarium* sp. dan *Colletotrichum* sp. Hasil identifikasi isolat BM2 menunjukkan bahwa isolat tersebut termasuk spesies anggota genus *Streptomyces*.

Kata kunci: *Actinomycetes*, antifungi, *Colletotrichum*, *Fusarium*, kitinase.

SUMMARY

Actinomycetes are a group of Gram-positive bacteria and are aerobic in nature. They are known for their excellent potential as biological control agents due to their ability to produce secondary metabolites that can inhibit the growth of pathogens. *Actinomycetes* are capable of producing antifungal agents that can inhibit the growth of pathogenic fungi such as *Fusarium* sp. and *Colletotrichum* sp. These *Actinomycetes* can be isolated from various natural sources, one of which is from waste of maggot residues. This research aims to determine the inhibitory ability of *Actinomycetes* isolates against the growth of the pathogenic fungi *Fusarium* sp. and *Colletotrichum* sp., understand the inhibitory ability of secondary metabolites produced by *Actinomycetes* isolates against the growth of the pathogenic fungi *Fusarium* sp. and *Colletotrichum* sp., and identify the characteristics of *Actinomycetes* isolates that can inhibit the growth of these two pathogens.

The study was conducted using a survey method at the Microbiology Laboratory of PT Biotek Cipta Kreasi and the Microbiology Laboratory of the Faculty of Biology, Jenderal Soedirman University. The research stages included the collection of maggot residue samples, isolation and purification of *Actinomycetes* isolates, rejuvenating of *Actinomycetes* isolates, antagonistic tests of *Actinomycetes* isolates against the pathogenic fungi *Fusarium* sp. and *Colletotrichum* sp., isolation of secondary metabolites from selected *Actinomycetes* isolate, enumeration of pathogenic fungi spore density, antifungal activity test of crude extract of selected *Actinomycetes* isolate against pathogenic fungi, antifungal activity test of crude supernatant from selected *Actinomycetes* isolate against pathogenic fungi, the growth curve production of selected *Actinomycetes* isolate, chitinase production of selected *Actinomycetes* isolate, chitinolytic activity test of selected *Actinomycetes* isolate, and characterization of selected *Actinomycetes* isolate. The data obtained were analyzed descriptively.

The research results obtained two isolates of *Actinomycetes* (BM1 and BM2) from maggot waste. Based on the research that has been conducted, it is known that isolate BM2 is capable of inhibiting the growth of pathogenic fungi *Fusarium* sp. and *Colletotrichum* sp. The secondary metabolites produced by the BM2 isolate were unable to inhibit the growth of the pathogenic fungi *Fusarium* sp. and *Colletotrichum* sp. Identification results of the BM2 isolate reveal that it belongs to the species of the genus *Streptomyces*.

Keywords: *Actinomycetes*, *antifungal*, *Colletotrichum*, *Fusarium*, *chitinase*.