

ABSTRAK

POTENSI *Bacillus* sp. ASAL TANAH KEBUN RAYA LIWA KABUPATEN LAMPUNG BARAT SEBAGAI AGEN BIOKONTROL TERHADAP SERANGGA

Oleh

SUCIANI MIFTAHUL JANAH

Kebun Raya Liwa (KRL) menjadi salah satu kawasan konservasi tanaman secara *ex-situ* dengan potensi kekayaan tumbuhan koleksi. Dalam menjalankan fungsinya sebagai tempat konservasi dan pariwisata maka diperlukan perawatan khusus pada koleksi tanaman agar mempertahankan kualitas tanaman serta daya tarik wisatawan. Salah satu faktor penurunan kualitas tanaman koleksi yaitu disebabkan oleh Organisme Pengganggu Tanaman (OPT) salah satunya serangga. Penanggulangan menggunakan pestisida kimia akan berdampak negatif terhadap ekosistem dan meningkatkan resistensi serangga. Oleh sebab itu, diperlukan cara penanggulangan alami (biokontrol) yang dapat menekan pertumbuhan OPT. Genus *Bacillus* telah banyak dilaporkan memiliki kemampuan menjadi agen biokontrol untuk menanggulangi populasi OPT. Tujuan dari penelitian ini diantaranya untuk mengetahui karakteristik *Bacillus* sp. dari tanah KRL melalui uji morfologi, fisiologi, dan biokimia serta mengetahui potensinya sebagai agen biokontrol terhadap serangga. Rancangan penelitian bersifat deskriptif kualitatif. Isolat bakteri dikarakterisasi secara makroskopik dan mikroskopik, uji enzimatik, uji fisiologis, dan uji biokimia. Hasil penelitian menunjukkan bahwa seluruh isolat terdeteksi adanya kristal protein. Nilai indeks proteolitik tertinggi dihasilkan isolat TBA 7 sebesar 4,6 mm. Indeks kitinolitik tertinggi dihasilkan isolat TMA 26 sebesar 2,5 mm, dan indeks lipolitik tertinggi dihasilkan isolat TMA 26 dan TB 5 sebesar 2,6 mm. Ketujuh isolat memiliki kemampuan membunuh *Spodoptera frugiperda* dengan waktu kematian paling cepat pada hari ke-3. Hal tersebut dikarenakan kristal protein bekerja sama dengan enzim yang dihasilkan bakteri untuk mendegradasi tubuh serangga.

Kata Kunci: Kebun Raya Liwa, *Bacillus* sp., Biokontrol, Serangga.

ABSTRACT

THE POTENTIAL OF *Bacillus* sp. FROM LIWA BOTANICAL GARDEN, WEST LAMPUNG AS AN INSECT BIOCONTROL AGENT

By

SUCIANI MIFTAHUL JANA

Liwa Botanical Garden is one of the *ex-situ* conservation areas that have the potential collection of plant diversity. In carrying out its function as a place of preservation and tourism, special treatment for plant collection is necessary to maintain plant quality as well as tourists' attraction. Plant quality may decrease due to the existence of Plant Destroying Organisms, such as insects. The use of chemical-based pesticides would likely harm the ecosystem and increase the insects' resistance. Therefore, natural control methods (biocontrol) are highly needed for inhibiting the growth of destructive insects. *Bacillus* has been widely reported to have the ability to be a biocontrol agent to destroy the population of insects. This study aims to determine the characteristics of *Bacillus* sp. from the soil of KRL through morphological, physiological, and biochemical tests and determine its potential as a biocontrol agent against insects. The study design is descriptive qualitative. Bacterial isolation is characterized by macroscopic and microscopic morphology tests, enzymatic tests, physiological tests, and biochemical tests. The results showed that seven isolates detected the presence of protein crystals. The highest proteolytic index value produced by TBA 7 was 4,6 mm. The highest chitinolytic index produced by TMA 26 was 2,5 mm, and the highest lipolytic index was produced by TMA 26 and TB 5 with an inhibition zone of 2,6 mm. It was known that seven isolates had the ability to kill *Spodoptera frugiperda*, the fastest effect being shown on the third day. The existence of bacterial protein crystals and enzymes could degrade the insect's body.

Keywords: Liwa Botanical Garden, *Bacillus* sp., Biocontrol, Insect.