

**AKTIVITAS BIOINSEKTISIDA NANOPARTIKEL PERAK HASIL
BIOSINTESIS MENGGUNAKAN ENTOMOPATOGEN TERHADAP
LARVA ULAT BAWANG (*Spodoptera exigua*)**

SKRIPSI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Sains
program studi Biologi



oleh

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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ENTOMOPATOGEN TERHADAP LARVA ULAT BAWANG (*Spodoptera exigua*)**

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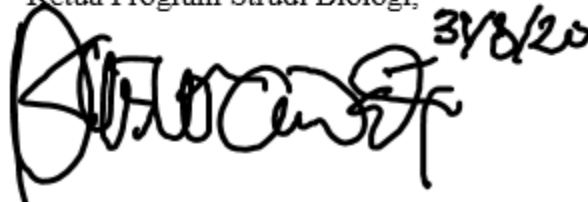


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PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul “**Aktivitas Bioinsektisida Nanopartikel Perak Hasil Biosintesis Menggunakan Entomopatogen Terhadap Larva Ulat Bawang (*Spodoptera exigua*)**” ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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ABSTRAK

Ulat grayak bawang (*Spodoptera exigua*) merupakan hama polifag yang sangat dihindari oleh para petani. Seiring berkembangnya ilmu pengetahuan dan teknologi, kini telah hadir nanoteknologi sebagai teknologi terbaru yang dipercaya dapat meningkatkan keefektifan suatu zat. Nanopartikel dapat disintesis dengan metode biologis menggunakan mikroorganisme. Tujuan dari penelitian ini adalah memberikan informasi mengenai aktivitas insektisida nanopartikel perak yang telah dibiosintesis dari jamur *Metarhizium*, *Trichoderma* dan bakteri *Bacillus* sebagai mikroorganisme entomopatogen. Nanopartikel perak yang digunakan dalam penelitian ini merupakan nanopartikel perak yang berhasil didapatkan melalui pensintesis dengan metode biologis menggunakan mikroorganisme entomopatogen. Jenis penelitian ini merupakan penelitian eksperimental dengan metode rancangan acak lengkap (RAL). Pengujian secara statistik dilakukan dengan uji Kruskal-Wallis. Pada penelitian ini, larva instar III *S. exigua* dicelupkan ke dalam setiap perlakuan selama 30 detik untuk selanjutnya dihitung kematiannya setiap jam pengamatan dilakukan. Rata-rata kematian setiap perlakuan dihitung dan ditampilkan persentasenya. Hasil dari penelitian ini menunjukkan adanya aktivitas insektisida pada nanopartikel perak yang telah dibiosintesis terhadap larva instar III *S. exigua*, namun hasil perhitungan statistik menunjukkan tidak adanya perbedaan yang nyata pada setiap perlakuan. Dalam penelitian ini, nanopartikel perak-*Bacillus* dan nanopartikel perak-*Metarhizium* merupakan nanopartikel perak yang paling memengaruhi kematian *S. exigua*. Perlakuan nanopartikel perak-*Bacillus* dan nanopartikel perak-*Metarhizium* merupakan perlakuan dengan persentase rerata kematian larva sebesar 100%.

Kata kunci: Nanopartikel perak, *Spodoptera exigua*, biosintesis nanopartikel perak, insektisida

**BIOINSECTICIDE ACTIVITY OF SILVER NANOPARTICLES
PRODUCT OF BIOSYNTHESIS USING ENTOMOPATHOGEN AGAINST
UNION CATERPILLAR (*Spodoptera exigua*)**

ABSTRACT

Onion armyworm (*Spodoptera exigua*) is a polyphagous pest that is highly avoided by farmers. As the development of science and technology, nanotechnology has now emerged as a renewable technology that is believed to increase the effectiveness of a substance. Nanoparticles can be synthesized by biological methods using microorganisms. The aim of this study is to provide information on the activity of silver nanoparticle insecticides that have been biosynthesized from the fungus *Metarhizium*, *Trichoderma* and bacteria *Bacillus* as entomopathogenic microorganisms. Silver nanoparticles used in this study were silver nanoparticles that were successfully obtained through synthesized by biological methods using entomopathogenic microorganisms. This type of research is an experimental study with a completely randomized design (CRD). The statistical test was performed using the Kruskal-Wallis test. On this study, the third instar larvae of *S. exigua* were dipped in each treatment for 30 seconds to count the death after each hour of observation. The average mortality of each treatment was calculated and the percentage displayed. The results of this study indicated that there was insecticidal activity on the nanoparticles that had been biosynthesized against third instar larvae of *S. exigua*, but the results of statistical calculations showed no significant difference in each treatment. In this study, silver nanoparticles-*Bacillus* and silver nanoparticles-*Metarhizium* were the silver nanoparticles that most influenced *S. exigua* mortality. Treatment silver nanoparticles-*Bacillus* and silver nanoparticles-*Metarhizium* were treatments with a mean proportion of larval mortality in the amount of 100%.

Keywords: *Silver nanoparticles, Spodoptera exigua, biosynthesis of silver nanoparticles, insecticide*

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