

**PATOGENISITAS *Bacillus thuringiensis* var. *kurstaki* Berl.
DENGAN UV PROTEKTAN TERHADAP LARVA ULAT
GRAYAK (*Spodoptera litura* Fab.) (Lepidoptera: Noctuidae) DI
LABORATORIUM**

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INTISARI

Bacillus thuringiensis var. *kurstaki* Berl. (*Bt*) adalah bioinsektisida untuk mengendalikan populasi hama tanaman kubis, salah satunya larva *Spodoptera litura* Fab. *Bt* mudah terdegradasi oleh sinar ultraviolet (UV), maka *Bt* harus diberi UV protektan. Penelitian ini bertujuan mempelajari aditif alami yang efektif sebagai UV protektan *Bt* dan lama sifat keefektifan aditif tersebut. Penelitian dilaksanakan pada bulan Juni sampai Oktober 2019. Ekstrak aditif (kunyit, daun kelor, cengkeh, dan daun sirih merah) dan *Bt* dengan konsentrasi uji 10x LC 95 pada Cawan petri dipapar sinar matahari dengan periode paparan 0, 1, 3, 7, 14, 21, dan 28 hari. Ekstrak aditif alami dan *Bt* yang telah dipapar sinar matahari diujikan pada larva *S. litura* Fab. instar pertama. Patogenisitas aditif dan *Bt* dilihat dari persentase mortalitas larva yang dianalisis dengan ANOVA *one way*. Lama keefektifan aditif dilihat dari waktu paruh bioinsektisida. Mortalitas larva terhadap *Bt* dan aditif menunjukkan pola fluktuatif. Pada perlakuan 28 hari, larva yang diberi ekstrak kunyit, daun kelor, dan daun sirih merah menunjukkan mortalitas 16.97%, 14.26%, dan 12.92% yang tidak berbeda signifikan dengan hasil kontrol positif (*Bt* tanpa ekstrak dan dipapar sinar matahari), yaitu 15.19%. Sedangkan larva yang diberi ekstrak cengkeh menunjukkan mortalitas 56.43% yang berbeda signifikan terhadap kontrol positif. Ekstrak kunyit, daun kelor, cengkeh, dan daun sirih merah menambah waktu paruh bioinsektisida menjadi 19.62, 14.10, 32.30, dan 13.23 hari. Berdasarkan hasil disimpulkan ekstrak aditif alami yang paling efektif sebagai UV protektan *Bt* adalah cengkeh. Penambahan keempat ekstrak meningkatkan waktu paruh bioinsektisida dengan penambahan waktu paruh paling lama disebabkan oleh ekstrak cengkeh.

Kata kunci: *Spodoptera litura* Fab., bioinsektisida, *Bacillus thuringiensis*, UV protektan, aditif alami

**PATHOGENICITY OF *Bacillus thuringiensis* var. *kurstaki* Berl.
WITH UV PROTECTANT AGAINST TOBACCO CUTWORM
LARVAE (*Spodoptera litura* Fab.) (Lepidoptera: Noctuidae) IN
LABORATORY**

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Abstract

Bacillus thuringiensis var. *kurstaki* Berl. (Bt.) is a bioinsecticide to control the population of cabbage plant pests, *Spodoptera litura* Fab larvae. *Bt* easily degraded by ultraviolet (UV), hence *Bt* must be given UV protectant. This research aims to study the pathogenicity of natural additives as *Bt* UV protectant and duration of the effectiveness of the additive. The research was conducted in June to October 2019. Extracts of additives (turmeric, moringa leaves, cloves, and Celebes pepper leaves) and *Bt* with a concentration of 10 x LC 95 were test on a petri dish exposed to sunlight with periods of 0, 1, 3, 7, 14, 21, and 28 days. Extracts of natural additives and *Bt* which have been exposed to sunlight were tested on *S. litura* Fab. first instar larvae. Pathogenicity of additives and *Bt* seen from the percentage of larval mortality analyzed by one way ANOVA. The effectiveness of additives is seen from the half-life of the bioinsecticide. Larval mortality for *Bt* and additives show fluctuating patterns. At 28 days treatment, larvae which were given turmeric extract, moringa leaves, and celebes pepper leaves showed mortality of 16.97%, 14.26%, and 12.92% which were not significantly different from the results of positive control (*Bt* without extract and sun exposure) 15.19 %. Whereas larvae which were given clove extract showed 56.43% mortality which was significantly different from positive control. Turmeric, moringa leaves, cloves, and red betel leaves increase the half-life of bioinsecticide to 19.62, 14.10, 32.30, and 13.23 days. Based on the results it was concluded that the most effective natural additive extract as *Bt* UV protectant is clove. The addition of the four extracts increased the half-life of bioinsecticide by adding the longest half-life caused by clove extract.

Keywords: *Spodoptera litura* Fab., bioinsecticide, *Bacillus thuringiensis*, UV protectant, natural additive