SINERGISME SPINOSYN A DAN BAHAN ADITIF ALAMI TERHADAP HAMA ULAT GRAYAK (*Spodoptera litura* Fab.) (Lepidoptera: Noctuidae) PADA TANAMAN KUBIS (*Brassica oleracea* L.)

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INTISARI

Ulat grayak (*Spodoptera litura* Fab.) merupakan hama polifagus yang merusak berbagai tanaman sayuran di Indonesia. Salah satu bentuk pengendalian hama ulat ini menggunakan bioinsektisida sehingga dapat terhindar dari resistensi dan resurgensi hama, serta tidak menimbulkan pencemaran lingkungan. Salah satu bioinsektisida yang dapat digunakan yaitu konsentrat berbahan aktif spinosyn A, Tracer®. Alternatif ini memang tidak memiliki dampak akumulasi residu di lingkungan namun tetap memiliki kendala lain yaitu waktu efektivitas dibatasi oleh durasi paparan dan sensitivitas tinggi terhadap sinar ultraviolet sehingga minat beli petani dan pekebun berkurang karena harus melalukan berulang kali paparan. Penambahan bahan aditif alami dipercaya mampu melapisi bioinsektisida ini sehingga menghambat degradasi akibat sinar UV . Penelitian ini bertujuan untuk mengetahui bahan aditif yag paling efektif dalam peningkatan persistensi mortalitas larva *S. litura* terhadap spinosyn A setelah penambahan berbagai jenis bahan aditif alami serta mengukur perbandingan waktu inaktivasi dan peningkatan waktu paruh antara bioinsektisida tanpa bahan aditif dengan bioinsektisida terproteksi bahan aditif. Penelitian ini menggunakan formulasi ekstrak aditif kunir, kelor, cengkeh dan sirih merah sebanyak 2% dan dilarutkan bersama bioinsektisida Tracer®. Uji skala lapang terbatas dilakukan di Stasiun Penelitian Sawitsari dengan memaparkan formulasi yang telah dibuat kepada tanaman kubis sebanyak 5 ulangan, daun tanaman kubis kemudian dikoleksi 0, 1, 3, 5, 7, 10, dan 15 hari setelah paparan. Uji patogenisitas dilakukan menggunakan pakan daun kubis yang telah dikoleksi dan diberikan ke larva intstar-1 *S. litura.* Mortalitas larva diamati setiap hari hingga 7 hari setelah pemberian pakan. Data mortalitas kemudian dianalisis dengan SPSS 25 menggunakan pendekatan One-Way ANOVA dan Regresi Probit untuk menentukan tingkat persistensi. Hasil yang diperoleh menunjukkan bahwa bahan aditif kunir yang paling efektif dalam meningkatkan persistensi mortalitas spinosyn A dengan memperlambat waktu inaktivasi dari dua hari menjadi tujuh hari, sedangkan jenis bahan aditif kelor, cengkeh, dan sirih merah memiliki waktu efektif hingga lima hari setelah paparan. Berdasarkan uji statistik, setiap perlakuan penambahan bahan aditif alami memiliki hasil yang berbeda nyata baik terhadap kontrol positif maupun kontrol negatif. Spinosyn A dengan aditif kunir memiliki waktu paruh sepuluh hari ketika terpapar matahari sehingga kunir berpotensi sebagai bahan tambahan untuk proteksi terdapat paparan ultraviolet.

Kata kunci : bioinsektisida, pengendalian hayati, *Spodoptera litura* Fab., Spinosyn A, Tracer®, degradasi UVB, aditif alami

SYNERGISM OF SPINOSYN A AND NATURAL ADDITIVES AGAINST ARMYWORM PEST (*Spodoptera litura* Fab.) (Lepidoptera: Noctuidae) ON CABBAGE PLANTS (*Brassica oleracea* L.)

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ABSTRACT

Armyworm (*Spodoptera litura* Fab.) is a polyphagous pest that damages various crop plants in Indonesia. Bioinsecticide can be used to control this type of pest so that it can avoid pest resistance and resurgence and does not cause environmental pollution. One of bioinsecticide that can be used is concentrate with the active ingredient spinosyn A, Tracer®. This alternative does not have the impact of residual accumulation in the environment but still has another obstacle which is the effective time is limited by the duration of exposure and high sensitivity to ultraviolet light so that buying interest of farmers and planters is reduced because they have to do repeatedly exposure. The addition of natural additives is believed to be able to coat this bioinsecticide so that it inhibits degradation due to UV rays. The aim of this study was to determine the most effective additive in increasing the persistence of *S. litura* larvae mortality to spinosyn A after the addition of various types of natural additives and to measure the ratio of inactivation time and increase in half-life between bioinsecticides without additives and bioinsecticides protected by additives. In carriying out this research used turmeric, moringa, clove and celebes pepper extracts as much as 2% and dissolved with Tracer® bioinsecticide. The limited field-scale test was carried out at Sawitsari Research Station by spraying the formulations that had been made to cabbage plants in 5 replicates, the leaves of the cabbage plants were collected 0, 1, 3, 5, 7, 10, and 15 days after treatment. Pathogenicity test was carried out using cabbage leaf feed that had been collected and given to instar-1 *S. litura* larvae. Larval mortality was observed every day up to 7 days after treatment. Mortality data were then analyzed with SPSS 25 using the One-Way ANOVA and Probit Regression approaches to determine the level of persistence and half-life. The results obtained indicate that turmeric additives are the most effective in increasing the persistence of spinosyn A mortality by slowing the time of inactivation from two days to seven days, while moringa, clove, and celebes pepper additives had an effective time of up to five days after exposure. Based on statistical tests, each treatment of natural additives has significantly different results on both positive and negative controls. Spinosyn A with turmeric additive has ten days of half-life when exposed to the sun so turmeric has the potential as an additional ingredient for protection with ultraviolet exposure.

Key words: bioinsecticide, biological control, *Spodoptera litura* Fab., Spinosyn A, Tracer®, UVB degradation, natural additives