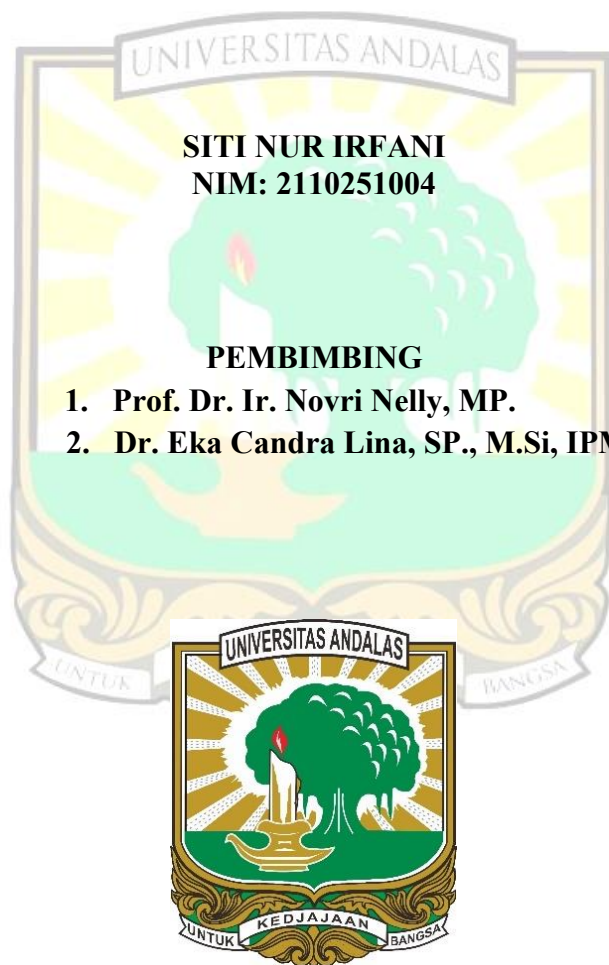


**EFIKASI NANOEMULSI EKSTRAK DAUN KACANG BABI  
(*Tephrosia vogelii* Hooker) TERHADAP HAMA UTAMA PADA  
TANAMAN BROKOLI (*Brassica oleracea* L. var. *Italica*)**

**SKRIPSI**

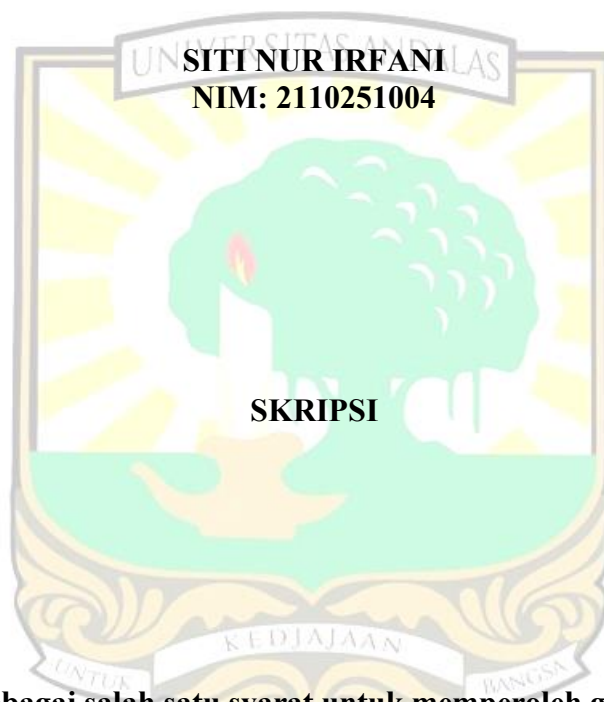
**Oleh**



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**Sebagai salah satu syarat untuk memperoleh gelar  
Sarjana Pertanian**

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# **EFIKASI NANOEMULSI EKSTRAK DAUN KACANG BABI (*Tephrosia vogelii* Hooker) TERHADAP HAMA UTAMA PADA TANAMAN BROKOLI (*Brassica oleracea* L. var. *Italica*)**

## **Abstrak**

Daun *Tephrosia vogelii* merupakan sumber insektisida nabati potensial yang bersifat racun perut. Penelitian ini bertujuan untuk mengetahui ukuran partikel dan kestabilan formulasi serta efektivitas dari nanoemulsi berbahan *T. vogelii* dalam mengendalikan *Crociodolomia pavonana* dan *Plutella xylostella* pada tanaman brokoli di lapangan. Percobaan lapangan menggunakan rancangan acak kelompok yang terdiri 4 perlakuan dan 6 kelompok. Perlakuan terdiri dari kontrol, nanoemulsi *T. vogelii*, bioinsektisida *Bacillus thuringiensis*, dan insektisida sintetik sipermetrin dengan metode pengamatan langsung pada tanaman sampel. Parameter yang diamati yaitu populasi larva *C. pavonana* dan *P. xylostella*, persentase tanaman terserang, tingkat efektivitas insektisida, dan ukuran partikel, tingkat homogenitas, serta kestabilan nanoemulsi *T. vogelii*. Hasil penelitian menunjukkan Formulasi nanoemulsi ekstrak daun *T. vogelii* berukuran nano (233,7 nm) dengan tingkat homogenitas tergolong homogen (0,459), dan memiliki tingkat kestabilan yang kurang stabil (1,3 mV). Pengamatan populasi *C. pavonana* dan *P. xylostella* berfluktuasi sepanjang 8 kali pengamatan. Formulasi nanoemulsi mampu menekan populasi *C. pavonana* dan *P. xylostella* lebih baik dibandingkan bioinsektisida *B. thuringiensis* namun tidak lebih efektif daripada insektisida sintetik. Rata-rata persentase tanaman terserang pada kontrol dan perlakuan nanoemulsi, insektisida sintetik, dan bioinsektisida secara berturut-turut sebesar 76,46%, 65,10%, 62,15%, dan 69,69%.

Kata kunci: *Crociodolomia pavonana*, *Plutella xylostella*, efektivitas, lapangan, populasi

# **EFFICACY OF NANOEMULSION FROM FISH-POISON BEAN LEAF EXTRACT (*Tephrosia vogelii* Hooker) AGAINST MAJOR PESTS ON BROCCOLI PLANTS (*Brassica oleracea* L. var. *Italica*)**

## **Abstract**

Nanoemulsion based on *Tephrosia vogelii* extract is a natural insecticide that acts as both a stomach poison. This study aimed to determine the particle size, formulation stability, and efficacy of *Tephrosia vogelii*-based nanoemulsion in controlling *Crociodolomia pavonana* and *Plutella xylostella* on broccoli plants in the field. The field experiment was conducted using a randomized block design (RBD) consisting of 4 treatments and 6 blocks. The treatments consisted of a control, *T. vogelii* nanoemulsion, *Bacillus thuringiensis* bioinsecticide, and the synthetic insecticide cypermethrin, using the direct observation method on the sample plants. The parameters observed included the larval populations of *C. pavonana* and *P. xylostella*, the percentage of infested plants, the level of insecticidal efficacy, the particle size, homogeneity level, and stability of the *T. vogelii* nanoemulsion. Observed parameters included larval population, percentage of infested plants, insecticide effectiveness, and nanoemulsion stability and particle size analysis. The study results showed that the population fluctuated throughout the observation period. The *T. vogelii* nanoemulsion formulation was nano-sized (233.7 nm), categorized as homogeneous with a polydispersity index (0.459), and exhibited low stability with a zeta potential (1.3 mV). Populations of *C. pavonana* and *P. xylostella* fluctuated throughout the eight observation periods. The nanoemulsion formulation suppressed *C. pavonana* and *P. xylostella* populations more effectively than the *B. thuringiensis*. The average plant infestation rates for the control and the treatments with nanoemulsion, synthetic insecticide, and bioinsecticide were recorded at 76.46%, 65.10%, 62.15%, and 69.69%, respectively.

Keywords: *Crociodolomia pavonana*, *Plutella xylostella*, effectiveness, field, population