

LARVICIDAL EFFECT OF VETIVER (*Vetiveria zizanioides*) ESSENTIAL OIL AGAINST *Culex quinquefasciatus* LARVAE

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ABSTRACT

Background: Filariasis is known as global health problem. *Culex quinquefasciatus* mosquito is the major vector of *Wuchereria bancrofti*, the most common pathogen in filariasis infestation cases. Both *Cx. quinquefasciatus* and *Wuchereria bancrofti* are widely distributed in South East Asia. Discontinuation of transmission chain can be done by using larvicide. Chemical larvicide will persist in the ecosystem for a long period of time and affect other organisms. Hence, developing an effective natural based larvicide that is environment friendly is important. This research investigated potential use *Vetiveria zizanioides* essential oil against *Cx. quinquefasciatus* larvae.

Objective: To investigate potential larvicidal effect of vetiver oil against *Cx. quinquefasciatus* larvae, effective concentration causing mortality, and relationship between concentration and larvae mortality.

Method: Varying concentrations of vetiver essential oil were introduced to 3rd and 4th instars of *Cx. quinquefasciatus* larvae for 24 hours under standardized conditions.

Results: The LC₅₀ and LC₉₀ of vetiver oil were 339.83 and 1102.40 ppm, respectively. Increasing the concentration of vetiver oil will increase larval mortality.

Conclusion: *Vetiveria zizanioides* essential oil is not an effective larvicide against *Cx. quinquefasciatus* larvae in laboratory settings with LC₅₀ and LC₉₀ of 339.83 ppm and 1102.40 ppm, and increasing its concentration causes increasing larvae mortality.

Keywords: *Culex quinquefasciatus* larvae, *Vetiveria zizanioides*, vetiver essential oil, larvicidal effect.

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ABSTRAK

Latar Belakang: Penyakit Filariasis, atau kaki gajah, telah dikenal sebagai masalah kesehatan dunia. Penyakit ini paling sering disebabkan oleh patogen *Wuchereria bancrofti*, dan ditularkan oleh nyamuk *Culex quinquefasciatus*. Patogen dan vektor ini tersebar luas di wilayah Asia Tenggara. Pemutusan rantai transmisi dapat dilakukan dengan menggunakan larvisida. Larvisida berbahan kimia menetap di lingkungan dalam periode yang cukup lama dan dapat mempengaruhi makhluk hidup lainnya, maka dari itu pengembangan larvisida natural sangatlah penting. Penelitian ini dilakukan untuk menguji efek larvisida minyak vetiver pada larva *Cx. quinquefasciatus*.

Tujuan: Menguji efek larvisida minyak vetiver terhadap larva *Cx. quinquefasciatus*, menetapkan dosis efektif, dan menentukan hubungan antara dosis dan mortalitas larva.

Metode: Berbagai dosis dari minyak vetiver dipaparkan pada instar 3 dan 4 larva *Cx. quinquefasciatus* selama 24 jam di bawah kondisi yang telah distandardisasi.

Hasil: LC50 dan LC90 dari minyak vetiver yaitu 339.83 dan 1102.40 ppm. Kenaikan dosis akan menyebabkan kenaikan mortalitas larva.

Kesimpulan: Minyak vetiver tidak cukup efektif dalam membunuh larva *Cx. quinquefasciatus* dalam setting laboratorium dengan LC50 dan LC90 masing-masing 339.83 dan 1102.40 ppm. Kenaikan dosis minyak vetiver menyebabkan kenaikan mortalitas larva.

Kata Kunci: Larva *Cx. quinquefasciatus*, *Vetiveria zizanioides*, minyak vetiver, efek larvisida.