

ABSTRAK

UJI *FOURIER-TRANSFORM INFRARED SPECTROSCOPY* (FTIR) PADA EKSTRAK ETANOL *Gracilaria* sp. DAN EFEKTIVITASNYA SEBAGAI OVISIDA NYAMUK *Aedes aegypti* VEKTOR DEMAM BERDARAH *DENGUE* (DBD)

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Penggunaan insektisida kimia menjadi salah satu metode dalam mengendalikan nyamuk *Aedes aegypti*, namun memberikan dampak negatif seperti polusi lingkungan dan resistensi nyamuk *Aedes aegypti* terhadap insektisida, sehingga diperlukan bahan alami untuk pengendalian nyamuk *Aedes aegypti*. Upaya pengendalian dapat dilakukan dengan menggunakan ovisida berbahan insektisida alami. Salah satu bahan alami yang dapat digunakan sebagai ovisida nyamuk *Aedes aegypti* adalah rumput laut. Rumput laut *Gracilaria* sp. diketahui mengandung senyawa alkaloid, flavonoid, triterpenoid, saponin, tanin, dan polifenol. Tujuan penelitian ini adalah untuk mengetahui kandungan senyawa metabolit sekunder dan efektivitas ekstrak etanol *Gracilaria* sp. sebagai ovisida nyamuk *Aedes aegypti*, serta nilai LC_{50} dan LT_{50} ekstrak etanol *Gracilaria* sp.. Penelitian ini menggunakan Rancangan Acak Lengkap (RAL). Terdapat 6 perlakuan terdiri dari konsentrasi ekstrak etanol *Gracilaria* sp. 0,5%; 1%; 1,5%; 2%; air PAM (kontrol negatif) dan 1% azadirachtin (kontrol positif). Hasil uji FTIR ekstrak etanol *Gracilaria* sp. menunjukkan gugus fungsi O-H, N-H, C-H, C=O, C=C, C≡C, C-O. Hasil *One-way* ANOVA menunjukkan adanya perbedaan nyata daya tetas telur antar perlakuan dengan nilai (Sig.) $p = 0,000$ ($p < 0,05$) selama waktu paparan 72 jam. Hasil uji tukey menunjukkan nilai rerata tertinggi pada konsentrasi 2% sebesar 14,00 (56%) dan rerata terendah pada konsentrasi 0,5% sebesar 10,75 (43%). Hasil uji efektivitas menunjukkan nilai LC_{50} ekstrak etanol *Gracilaria* sp. sebesar 1,59%, sedangkan nilai LT_{50} ekstrak etanol *Gracilaria* sp. sebesar 11,91 jam.

Kata Kunci: *Aedes aegypti*, *Gracilaria* sp, Ovisida, FTIR.

ABSTRACT

FOURIER-TRANSFORM INFRARED SPECTROSCOPY (FTIR) TEST ON ETHANOL EXTRACT OF *Gracilaria* sp. AND ITS EFFECTIVENESS AS *Aedes aegypti* MOSQUITO OVICIDE, A DENGUE HEMORRHAGIC FEVER (DHF) VECTOR

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The use of chemical insecticides is the method in controlling *Aedes aegypti* mosquitoes, but it has negative impacts such as environmental pollution *Aedes aegypti* and mosquito resistance to insecticides, so natural ingredients are needed to control *Aedes aegypti* mosquitoes. Control efforts can be carried out by using ovicides made from natural insecticides. One of the natural ingredients that can be used as an ovicide for *Aedes aegypti* mosquitoes is seaweed. *Gracilaria* sp. seaweed is known to contain alkaloids, flavonoids, triterpenoids, saponins, tannins, and polyphenols. The purpose of this study was to determine the content of secondary metabolite compounds and the effectiveness of *Gracilaria* sp. ethanol extract as an ovicide for *Aedes aegypti* mosquitoes, as well as the LC₅₀ and LT₅₀ values of *Gracilaria* sp. ethanol extract. This study used a Completely Randomized Design (CRD). There were 6 treatments consisting of *Gracilaria* sp. ethanol extract concentrations of 0.5%; 1%; 1.5%; 2%; PAM water (negative control) and 1% azadirachtin (positive control). The results of the FTIR test of *Gracilaria* sp. ethanol extract showed functional groups O-H, N-H, C-H, C=O, C=C, C≡C, C-O. One-way ANOVA results showed a significant difference in egg hatching power between treatments with a value (Sig.) $p = 0.000$ ($p < 0.05$) during an exposure time of 72 hours. The results of the Tukey test showed the highest average value at a concentration of 2% of 14.00 (56%) and the lowest average at a concentration of 0.5% of 10.75 (43%). The results of the effectiveness test showed the LC₅₀ value of the *Gracilaria* sp. ethanol extract of 1.59%, while the LT₅₀ value of the *Gracilaria* sp. ethanol extract was 11.91 hours.

Keywords: *Aedes aegypti*, *Gracilaria* sp, Ovicide, FTIR.