

Studi Potensi Aktivitas Antibakteri dan Toksisitas terhadap *Daphnia magna* Senyawa Amida Oleat Terhidrasi-Amilamina = Potential Study of Antibacterial Activity and Toxicity Against *Daphnia magna* Hydrated Oleic-Amylamine Amide Compound

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Abstrak

Asam oleat telah diketahui sebagai asam lemak yang memiliki aktivitas biologis. Pada penelitian ini disintesis turunan dari asam oleat, yaitu amida oleat terhidrasi-amilamina, serta diuji aktivitas antibakteri dan toksisitasnya. Sintesis amida oleat terhidrasi-amilamina terdiri atas tiga tahap reaksi, yaitu (1) esterifikasi asam oleat, (2) hidrasi metil oleat dengan katalis H₂SO₄ 1%, dan (3) amidasi metil hidroksistearat dengan amilamina. Hasil penelitian menunjukkan bahwa produk amida oleat terhidrasi-amilamina berhasil disintesis, yang dibuktikan dengan munculnya beberapa puncak serapan, yakni N-H amida pada rentang 3610 – 3156 cm⁻¹, C=O amida pada 1647 cm⁻¹, dan N-H amida pada 1432 cm⁻¹. Senyawa amida oleat terhidrasi-amilamina diuji aktivitas antibakteri pada konsentrasi 500 ppm terhadap bakteri *Staphylococcus aureus* dan *Escherichia coli*. Hasil uji memperlihatkan aktivitas yang sangat lemah dengan diameter zona hambat sebesar 6,5 mm. Uji toksisitas juga dilakukan terhadap *Daphnia magna*, dengan hasil bahwa produk amida oleat terhidrasi-amilamina tergolong senyawa toksik lemah dengan nilai LC₅₀ sebesar 21,02 ppm.

.....Oleic acid has been known as a fatty acid that has biological activity. In this study, a derivative of oleic acid was synthesized, hydrated oleic amide-amylamine, and tested for its antibacterial activity and toxicity. The synthesis of hydrated oleic amide-amylamine consisted of three reaction steps, particularly (1) esterification of oleic acid, (2) hydration of methyl oleate with 1% H₂SO₄ catalyst, and (3) amidation of methyl hydroxystearate with amylamine. The results showed that the hydrated oleic amide-amylamine was successfully synthesized, as proved by the appearance of several absorption peaks, especially N-H amide in the range 3610 – 3156 cm⁻¹, C=O amide at 1647 cm⁻¹, and N-H amide at 1432 cm⁻¹. Hydrated oleic amide compound-amylamine then was tested for antibacterial activity at a concentration of 500 ppm against *Staphylococcus aureus* and *Escherichia coli* bacteria. The test results showed very weak activity with an inhibition zone diameter of 6.5 mm. Toxicity test was also carried out against *Daphnia magna*, with the result that the hydrated oleic amide-amylamine was classified as a weak toxic compound with an LC₅₀ value of 21.02 ppm.