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.