Sintesis Turunan Asam Amino Glisin dan Fenilalanin dari Asam Laurat serta Uji Toksisitas dan Uji Antimikrobanya = Synthesis of Amino Acid Derivatives of Glycine and Phenylalanine from Lauric Acid and Their Toxicity Assay and Antimicrobial Test

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Abstrak

Penelitian ini bertujuan untuk melakukan sintesis turunan asam amino dari asam laurat membentuk senyawa lipoamida. Penelitian ini diawali dengan esterifikasi asam laurat menggunakan dry metanol dan bantuan katalis asam HCl pekat. Selanjutnya, campuran tersebut diekstrasi dengan air untuk mendapatkan fasa organiknya berupa metil laurat dan dimurnikan menggunakan kromatografi kolom. Kemudian metil laurat diamidasi dengan asam amino glisin dan fenilalanin agar dihasilkan senyawa lipoamida glisin-laurat dan fenialanin-laurat. Produk yang terbentuk dikarakterisasi menggunakan FTIR. Hasilnya menunjukkan bahwa masing-masing produk ester memberikan pita serapan medium vibrasi C-N pada bilangan gelombang 1026,17 cm-1 pada glisin-laurat dan 1015,56 cm-1 pada fenilalanin-laurat. Hasil uji toksisitas melalui metode BSLT terhadap larva Artemia salina L. didapatkan nilai LC50 senyawa lipoamida glisin-laurat dan fenilalanin-laurat, masing-masing sebesar 175,724 ppm, dan 1494,729 ppm. Uji aktivitas antimikroba dari semua produk lipoamida menunjukkan adanya aktivitas antimikroba. Kedua senyawa lipoamida memiliki zona hambat yang sama terhadap pertumbuhan bakteri Escherichia coli, sebesar 10 mm, sedangkan senyawa glisin-laurat dan fenilalanin-laurat memiliki zona hambat terhadap pertumbuhan bakteri Staphylococcus aureus, secara berurutan 7 mm dan 8 mm.

.....This study discusses about synthesis of amino acid with lauric acid to form lipoamida compound which has toxicity property. In this research, esterification of lauric acid with dry methanol using concentrated HCl as acid catalyst. Furthermore, the solution was extracted with water to obtain organic phase (methyl laurate) and purified by column chromatography. Then, amidation of methyl laurate with the amino acids, glycine and phenylalanine, respectively. Amidation reaction produces glycine-laurate and phenylalanine-laurate lipoamida compounds. All of ester products were identified using FTIR. The results showed that each lipoamida product gave absorption band C-N at the range of wave number 1026,17 cm-1 for glycine-laurate dan 1015,56 cm-1 for phenylalanine-laurate. The results of the toxicity test using the BSLT method on Artemia salina L. larvae obtained the LC50 values of glycine-laurate and phenylalanine-laurate lipoamida compounds, respectively 175,724 ppm and 1494,729 ppm. Antimicrobial activity test of all lipoamida products had antimicrobial activity. Both lipoamida compounds have the same zone of inhibition for the growth of Escherichia coli bacteria, which is 10 mm. Meanwhile, glycine-laurate and phenylalanine-laurate compounds had zone a inhibition against the growth of Staphylococcus aureus bacteria, respectively 7 mm and 8 mm.