

Studi potensi senyawa ester gliserol asam lemak hidrolisis minyak sawit dan asam oleat hasil sintesis enzimatis sebagai emulsifier dan antimikroba = Study of potential of glycerol palm oil fatty acid and glycerol oleic acid esters obtained by enzymatic synthesis as emulsifier and antimicrobial agents

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Abstrak

Pada penelitian ini, dilakukan sintesis senyawa ester gliserol asam lemak hasil hidrolisis minyak sawit dan ester gliserol oleat secara enzimatis menggunakan lipase *Candida rugosa* EC. 3.1.1.3 dalam pelarut n-heksana. Optimasi reaksi dilakukan dengan membuat variasi perbandingan mol antara asam lemak dengan gliserol, yaitu 1:1, 1:2, 1:3, dan 1:4. Hasil persen konversi tertinggi diperoleh dari variasi perbandingan 1:4 sebesar 42 untuk ester gliserol asam lemak hidrolisis minyak sawit dan 58 untuk ester gliserol oleat. Hasil karakterisasi menggunakan FT-IR untuk ester gliserol asam lemak hidrolisis minyak sawit dan ester gliserol oleat menunjukkan adanya puncak serapan gugus C=O ester pada bilangan gelombang 1748 cm⁻¹. Pada ester gliserol asam lemak hidrolisis minyak sawit dan ester gliserol oleat dilakukan uji emulsifier. Tipe emulsi yang terbentuk adalah minyak dalam air o/w. Uji aktivitas antimikroba ester gliserol asam lemak hasil hidrolisis minyak sawit maupun ester gliserol asam oleat ternyata tidak dapat menghambat pertumbuhan *Staphylococcus epidermidis* dan *Propionibacterium acnes*.

Synthesis of glycerol palm oil fatty acid ester and glycerol oleic acid ester were conducted enzymatically using Candida rugosa lipase EC. 3.1.1.3 in n hexane solvent. Optimization of esterification reaction was carried out by varying the mole ratio of fatty acid to glycerol 1 1 2 1 3 1 4. The highest conversion percentage was obtained at mole ratio 1 4 with the value of 42 for glycerol palm oil fatty acid ester and 58 for glycerol oleic ester. Esterification products were characterized by FT IR.

The FT IR spectrum showed the ester bond was formed as indicated at 1748 cm⁻¹ for the absorption peak of C O ester group. Both esters were then examined by simple emulsion test and were proved to be an emulsifier. Based on the emulsion test, it was proved that the esterification products have properties as an emulsifier for oil in water o/w emulsion type. The antimicrobial activity assay showed that glycerol palm oil fatty acid ester and and glycerol oleic acid ester cannot inhibit the growth of Staphylococcus epidermidis and Propionibacterium acnes.