

Application of lipase technology for transesterification of fatty acid ester

Abstract

We have reported the potency of microbial extracellular enzyme for synthesis of fatty acid ester. Further investigation was aimed to study capacity of the enzyme on bioprocess of crude palm oil by transesterification of saturated fatty acid to fatty acid ester. We have studied some lipases from culture filtrate of *Candida rugosa* FM-9301, *Bacillus subtilis* FM-9101 and *Pseudomonas aerogenes* FM-9201, which were preincubated in a medium containing olive oil as inducers, using a shaker under conditions that allowed for lipase production at pH 4.5-6.5 and room temperature for 5 days. Those strains shown different activities during the hydrolysis of substrates, which resulted in decreasing or increasing free fatty acids those, were liberated from media containing crude palm oil and organic solvents. The optimal transesterification condition was at temperature of 45-50°C and at pH 4.5 for *C. rugosa* and pH 6.0 to 7.0 for *P. aerogenes* and *B. subtilis*. Under the enzyme concentration of 50% (v/v), the transesterification was rapidly occurred, while at the concentration of 20% (v/v) the enzymatically biosynthesis required longer incubation period. The substrates incubated with *C. rugosa* lipase exhibited higher linoleic and linolenic acid (7.16 and 2.15%, respectively), than that of *B. subtilis* lipase (4.85% and 1.43%, respectively), while *P. aerogenes* lipase (3.73% and 1.11%, respectively).