

Abstract

Biotechnological Complex Based on Lipase and β -Cyclodextrin on Hydrolysis of Acylglycerides in Plant Oils and Fats [†]

Viktor Andreevich Filatov ^{1,2,*} and Grigoriy Gennadevich Evseev ^{2,*}

¹ Faculty of Based Medicine, Lomonosov Moscow State University, Lomonosovsky Avenue 27/1, 119991 Moscow, Russia

² SkyLad AG, Superlab Suisse Epalinges SA, Route de la Corniche 6, 1066 Epalinges, Switzerland

* Correspondence: filatovviktor097@gmail.com (V.A.F.); evseev@splat.ru (G.G.E.)

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Abstract: The present study aimed to evaluate in vitro enzymatic activity of a novel biotechnological active complex based on natural origin compounds—thermophilic lipase and β -cyclodextrin—for hydrolysis of acylglycerides in plant oils and fats. β -cyclodextrin (β -CD) as an additive has attracted attention for its enhanced stability and efficiency of enzymes. In present study, the effects of β -CD on enzymatic hydrolysis of acylglycerides by thermophilic lipase were investigated by modern methods. The UV-spectroscopy, electron microscopy with TEM and kinetics of enzymatic hydrolysis were compared by the addition of β -CD. The results showed that lipase could produce the highest yield of oleic acid in presence of β -CD after 1 and 3 h. The UV spectroscopy demonstrated that the absorbance and fluorescence of lipase decreased with increasing concentration of β -CD due to surface interaction and change of enzyme configuration. Moreover, electron microscopy with TEM showed that lipase formed a special active conglomerate with β -CD for improving hydrolysis and stability. Dermatology evaluation indicated that this complex, when added to household products, did not affect sensitive skin of hands. Overall results indicate that β -CD could increase enzymatic activity of the lipase against acylglycerides and can be considered as promising composition in ecological household products for regular hand application.

Keywords: lipase; β -cyclodextrin; biocomplex; synergy; acylglycerides

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