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Investigating the effect of lipase from *Candida rugosa* on the production of EPA and DHA concentrates from *Kilka* fish (*Clupeonella cultiventris caspia*)

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Abstract

Candida rugosa lipase (CRL) was used to concentrate n-3 polyunsaturated fatty acids (PUFA) by removing non n-3 PUFA from glycerol backbone of triacylglycerol (TAG) in *Kilka* fish oil. The acidity value of the reaction mixture was inversely proportional to the concentrated glyceride yield, with a correlation coefficient (R^2) ranging from 0.82 to 0.98. Releasing the fatty acids from TAGs was significantly ($P < 0.05$) increased by decrease in water-to-oil ratio from 3 to 1, or by increasing the amount of enzyme (0.50 to 2%) over 3h of reaction time. The lipase preference for the constituent fatty acids was in the decreasing order: palmitoleic acid > oleic acid ≥ palmitic acid > stearic acid > EPA > DHA. The discrimination of CRL against eicosapentaenoic acid (EPA) plus docosahexaenoic acid (DHA) was significantly reduced throughout the reaction time (0 to 180 min). According to full factorial optimization results, the maximum recovery levels of DHA (72.10%) and EPA (33.60%), as well as minimum recovery levels of SFA (22.49%) and MUFA (18.62%) in the glyceride product were obtained through a

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