

Accepted Manuscript

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PII: S0023-6438(18)30290-1

DOI: [10.1016/j.lwt.2018.03.066](https://doi.org/10.1016/j.lwt.2018.03.066)

Reference: YFSTL 6995

To appear in: *LWT - Food Science and Technology*

Received Date: 29 October 2017

Revised Date: 29 January 2018

Accepted Date: 24 March 2018

Please cite this article as: Hosseini, H., Ghorbani, M., Jafari, S.M., Mahoonak, A.S., Investigating the effect of lipase from *Candida rugosa* on the production of EPA and DHA concentrates from *Kilka* fish (*Clupeonella cultiventris caspia*), *LWT - Food Science and Technology* (2018), doi: 10.1016/j.lwt.2018.03.066.

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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 5

Candida rugosa lipase (CRL) was used to concentrate n-3 polyunsaturated fatty 6 acids (PUFA) by removing non n-3 PUFA from glycerol backbone of 7 triacylglycerol (TAG) in *Kilka* fish oil. The acidity value of the reaction mixture 8 was inversely proportional to the concentrated glyceride yield, with a correlation 9 coefficient (R^2) ranging from 0.82 to 0.98. Releasing the fatty acids from TAGs 10 was significantly ($P < 0.05$) increased by decrease in water-to-oil ratio from 3 to 1, 11 or by increasing the amount of enzyme (0.50 to 2%) over 3h of reaction time. The 12 lipase preference for the constituent fatty acids was in the decreasing order: 13 palmitoleic acid > oleic acid \geq palmitic acid > stearic acid > EPA > DHA. The 14 discrimination of CRL against eicosapentaenoic acid (EPA) plus docosahexaenoic 15 acid (DHA) was significantly reduced throughout the reaction time (0 to 180 min). 16 According to full factorial optimization results, the maximum recovery levels of 17 DHA (72.10%) and EPA (33.60%), as well as minimum recovery levels of SFA 18 (22.49%) and MUFA (18.62%) in the glyceride product were obtained through a 19

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