Production of Docosahexaenoic Acid and Eicosapentaenoic Acid Ethyl Esters Concentrates by Enzymatic Hydrolysis

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The production of Omega-3 (n-3) polyunsaturated fatty acids (PUFAs) concentrates rich in *cis*-4, 7, 10, 13, 16, 19-docosahexaenoic acid (DHA) and *cis*-5, 8, 11, 14, 17-eicosapentaenoic acid (EPA) was studied using lipase-catalyzed hydrolysis of a tuna oil ethyl esters mixture (FOEE). The lipases from *Yarrowia lipolytica* (YLL2), *Thermomyces lanuginosus* (TLL), and *Candida rugosa* (CRL1, CRL3 and CRL4) were used for the hydrolysis of the FOEE and concentration of DHA and EPA in the ethyl fraction.

All lipases studied were capable of concentrating the DHA ethyl ester (DHA-EE) but only YLL2 and TLL can discriminate between EPA and DHA and can produce concentrates rich in DHA-EE. The highest DHA purity was obtained with YLL2 (73%) and TLL (65%) with a recovery percentage of DHA-EE of 89% and 85% for YLL2 and TLL respectively.

Lip2 from *Y. lipolytica* is consequently one of the most efficient lipase for the purification of DHA-EE. Lip2Yl improvement by directed mutagenesis is an option to boost the specificity toward EPA-EE and reduce the hydrolysis of DHA-EE.