

Enzymatic synthesis of lipophilic rutin and vanillyl esters from fish byproducts.

Abstract:

Lipase-catalyzed synthesis of lipophilic phenolic antioxidants was carried out with a concentrate of n-3 polyunsaturated fatty acids (PUFAs), recovered from oil extracted from salmon (*Salmon salar*) byproduct. Vanillyl alcohol and rutin were selected for the esterification reaction, and obtained esters yields were 60 and 30%, respectively. The antioxidant activities of the esters were compared with those of commercial butylated hydroxytoluene (BHT) and α -tocopherol using DPPH radical scavenging and thiobarbituric acid assays. In the DPPH assay, rutin esters showed better activity than vanillyl esters, and on the contrary in lipophilic medium, vanillyl esters were found to be superior to rutin esters. In bulk oil system, the antioxidant activities of rutin and vanillyl derivatives were lower than that of BHT and α -tocopherol, but in emulsion, they showed better activity than α -tocopherol. By attaching to natural phenolics, the PUFAs are protected against oxidation, and PUFA improves the hydrophobicity of the phenolic, which could enhance its function in lipid systems.