A PHOSPHOLIPID-ENRICHED CHIA OIL WITH POTENTIAL HEALTH BENEFITS

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ABSTRACT

In addition to triacylglycerols (TAGs), chia oil has a minor lipid fraction of phospholipids (PL) whose amphiphilic character and excellent biocompatibility make them suitable for numerous applications with technological and nutritional importance and potential health benefits. Their isolation entails certain difficulties, so we evaluated the efficiency of the extraction of these compounds by means of a sequential process involving the combination of two environmentally friendly techniques, supercritical fluid extraction (SFE) and pressurized liquid extraction (PLE). As a result, two fractions with markedly different compositions were obtained. An oil rich in PUFAs (including most of the TAGs) was extracted during the first stage using pure SC-CO2. On the other hand, the re-extraction by PLE (using food grade ethanol) of the chia cake, previously defatted by SFE (second step), allowed to obtain an oil extract highly enriched in PLs, whose content exceeded 16% and which still retained considerable amounts of omega-3 fatty acids. Moreover, up to 5 different individual PL species were observed in this extract (traces of PC, PE, PI, PS, PA and even sphingolipids (SLs), In addition, the large variety of individual PL species identified in PLE oil makes it interesting as a potential ingredient for multiple purposes in both the pharmaceutical and food industries. However, it should be noted the importance of controlling the extraction parameters to limit the presence of phospholipase D activity (PLD), and thus, avoid the formation of phosphatidic acid (PA).

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