

Commercial Soy Lecithins Analysis: EASI-MS vs MALDI-TOF

Fernandes, G. D.^{1*}, Alberici, R. M.², Pereira, G. G.¹, Cabral, E. C.², Eberlin, M. N.²
Barrera-Arellano, D. ¹Fats and Oils Laboratory, Faculty of Food Engineering, ²Thomson
Mass Spectrometry Laboratory, Institute of Chemistry, University of Campinas -
UNICAMP, Campinas, SP, BRAZIL. *gabrieldfcac@hotmail.com

Lecithins are composed mainly of the phospholipids (PL), triacylglycerols (TAG) and free fatty acids (FFA). Phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylserine (PS), phosphatidylinositol (PI), phosphatidic acid (PA), glycerophospholipids (GPL) and their lysoforms (eg.: LPE, LPC) are the major phospholipids found in vegetal sources. MALDI-TOF is the most widely mass spectrometry technique used in lipids analysis, however, requires a short sample preparation which involves cocrystallization of the sample and the ionization matrix. Easy ambient sonic-spray ionization mass spectrometry (EASI-MS) has shown to be an inexpensive, fast and accurate technique for analysis of lipids, without sample preparation. This work compares the results obtained for commercial lecithins by EASI-MS and MALDI-TOF-MS techniques. Six different commercial lecithin samples were used as one Standard Fluid, two Refined, one Enzyme-Modified, one Acetylated (Acet) and one Deoiled. For the EASI(+)-MS analysis, samples were diluted in chloroform (1:50) and 2 μ L of each one were analyzed using methanol as spray solvent; for EASI(-)-MS analysis methanol was doped with 0.1% of NH_4OH was used. For the MALDI(+)-TOF analysis lecithin samples were diluted (1:100) in chloroform and 1 μ L of solution was placed onto a MALDI steel target plate and overlaid with 1 μ L of matrix solution, consisted of 2,5-Dihydroxybenzoic acid (DHB); for the MALDI(-)-TOF analysis 1 μ L of 9-aminocridine matrix solution was used. In the EASI(+)-MS analysis were detected ions, corresponding to LPC, PC and TAG molecules, while, the FFA, LPE, LPE Acet, PE, PE Acet and GPL were detected in the EASI(-)-MS analysis. Moreover, ionic suppression effects were observed in the MALDI(+/-)-TOF analysis and only the ions corresponding to PC and GPL were detected. So, when compared to MALDI-TOF analysis, EASI-MS showed superior results displaying much detailed structural information on TAG, PC, LPC, FFA, PE (Acet), LPE (Acet) and GPL composition. EASI(+)-MS and EASI(-)-MS has shown therefore to offer a rapid, simple and efficient technique to characterize and monitor the quality of commercial lecithin samples. It seems also capable of monitoring composition of transformation processes.