Regiospecific analysis of Mono and Diglycerides in Glycerolysis products by GC x GC TOF-MS.

ABSTRACT

Comprehensive bidimensional gas chromatography coupled with time-of-flight mass spectrometry (GC × GC-TOF-MS) was used for the characterization of regiospecific mono- and diglycerides (MG-DG) content in the glycerolysis products derived from five different lipids included lard (LA), sun flower seed oil (SF), corn oil (CO), butter (BU), and palm oil (PA). The combination of fast and high temperature non-orthogonal column set namely DB17ht (6 m × 0.10 mm × 0.10 μm) as the primary column and SLB-5 ms (60 cm × 0.10 mm × 0.10 μm) as the secondary column was applied in this work. System configuration involved high oven ramp temperature to obtain precise mass spectral identification and highest effluent's resolution. 3-Monopalmitoyl-sn-glycerol (MG 3-C16) was the highest concentration in LA, BU and PA while monostearoyl-sn-glycerol (MG C18) in CO and 1,3-dilinoleol-rac-glycerol (DG C18:2c) in SF. Principal component analysis accounted 82% of variance using combination of PC1 and PC2. The presence of monostearoyl-sn-glycerol (MG C18), 3-Monopalmitoyl-sn-glycerol (MG 3-C16), 1,3-dilinoleol-rac-glycerol (DG C18:2c), 1,3-dipalmitoyl-glycerol (DG 1,3-C16), and 1,3-dielaidin (DG C18:1t) caused differentiation of the samples tested.

Keyword: Monoglycerides; Diglycerides; Comprehensive two-dimensional gas chromatography; GC x GC; Time-of-flight; Mass spectrometry.