- **Characterisation of traditional Macedonian edible oils by their fatty acid composition and their volatile compounds**

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  Abstract:
  The fatty acid composition and volatile compounds of selected traditional Macedonian edible oils of several varieties, including sunflower seeds, pumpkin seeds, flax seed, rapeseed and sesame seeds, were analysed. The fatty acid (FA) composition was determined by GC-FID analysis after transesterification into the corresponding methyl esters. α-Linolenic acid (C18:3) was the main unsaturated fatty acid in flax seed oil (56.2% of total FA), oleic acid (C18:1) dominated in rapeseed and sesame seed oils (65.3 and 43% of total FA, respectively), and linoleic acid (C18:2) was the dominant compound in sunflower and pumpkin seed oils (59.2 and 59.5% of total FA, respectively). The volatile flavour compounds were determined using headspace solid phase microextraction (HS-SPME) using a DVB/Carboxen/PDMS fibre, coupled with gas chromatography–mass spectrometry (GC–MS). In total 97 volatile compounds were detected revealing a very complex aroma profile of the oils, composed of acids, alcohols, aldehydes, alkanes, alkenes, esters, furans, pyrazines, sulphur compounds and terpenes. Among them, aldehydes presented the highest proportion of the overall volatiles in rapeseed oil (76.8% of the total volatiles), followed by sesame seed oil (25% of the total volatiles), pumpkin seed (5.45% of the total volatiles), flax seed oil (2.5% of the total volatiles) and sunflower seed oil (0.95% of the total volatiles). Terpenes (41 detected) were the dominant compounds in sunflower seed oil and pumpkin seed oil (93.9 and 87.8% of the total terpenes, respectively), followed by flax seed oil (47.6% of the total terpenes), sesame seed oil (21.5% of the total terpenes) and rapeseed oil (10% of total the terpenes). Sunflower seed and pumpkin seed oil showed the highest number of volatile compounds identified, with the highest number of terpenes and esters within the investigated products.

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