19th Euro Fed Lipid Congress and Expo
17–20 September 2023 Poznań · Poland

UNIVERSITY OF NOVI SAD
FACULTY OF TECHNOLOGY NOVI SAD

Science Fund of the Republic of Serbia
Program IDEAS

Lipid extracts of harvest residues of wheat, corn and sunflower from Serbia: Investigation of fatty acid composition

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Introduction & Problem Description

In Serbia, agricultural waste is insufficiently used waste, because it is most often burned. Burning crop residues represents a great environmental risk, because it is a frequent cause of fires. On the other hand, harvest residues contain various components that could be used in the food and pharmaceutical industry.

Aim of the Work

In this paper gas chromatography-mass spectrometry (GC-MS) was utilized to provide comprehensive characterization of the chemical composition of lipid extracts of wheat, corn and sunflower harvest residues.

Materials & Methods

The lipid extraction from the harvest residues was carried out by in semi-industrial conditions, using hexane as solvent. Most of the examined components in lipid extracts were related to fatty acids.

Results, Discussion & Conclusions

Namely, only 21.68%, 13.02% and 16.85% of lipid extracts of wheat, corn and sunflower harvest residues, respectively, were other components. High levels of unsaturated fatty acids, composed mainly of linoleic (C18:2) and oleic acid (C18:1) fatty acid was noticed. Linoleic fatty acid was most abundant fatty acid in the wheat and sunflower lipid extracts containing 26.76% and 34.34%, respectively, while the second most abundant was in corn extract (24.01%), right behind oleic fatty acid (C18:1) with 29.32%. Of the polyunsaturated fatty acids, less than 3% was detected the presence of alpha linolenic fatty acid (C18:3, n3). Concerning the saturated fatty acids, palmitic fatty acid was dominant. Its content ranged from 6.13%, detected in sunflower extract to 23.74%, found in wheat extract.

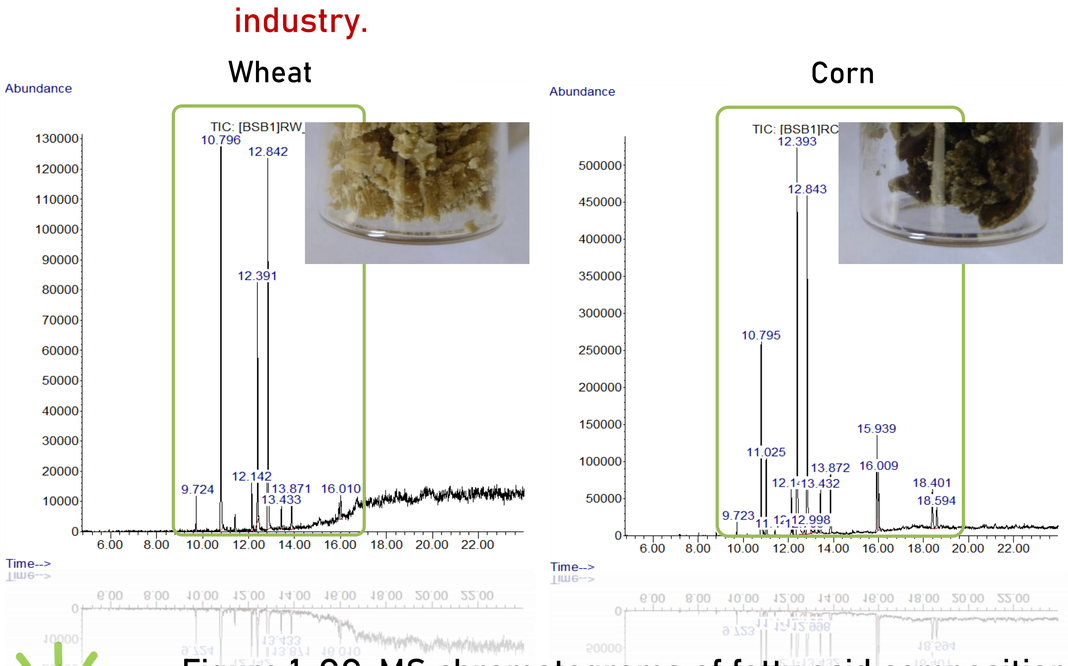

Figure 1. GC-MS chromatograms of fatty acid composition of lipid extracts of wheat, corn and sunflower harvest residues

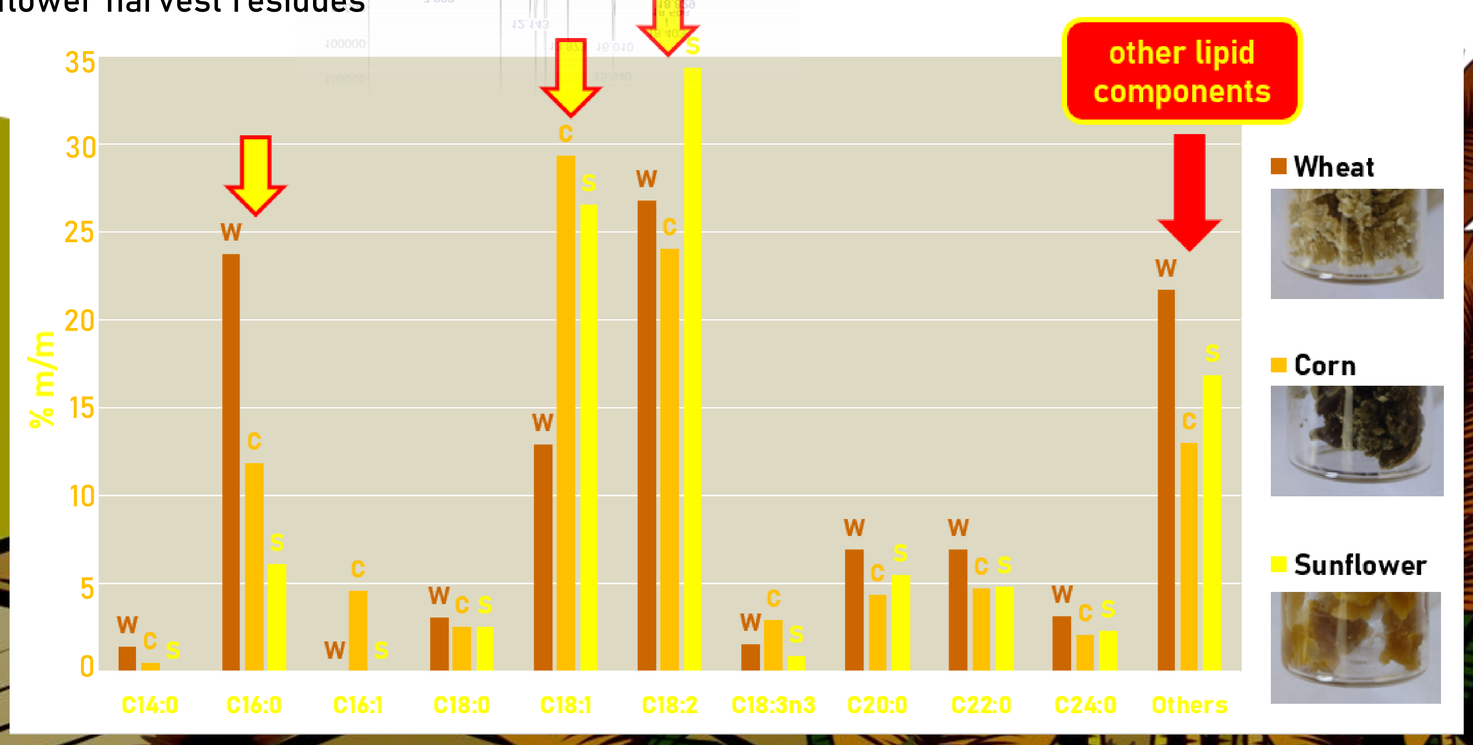

Figure 2. Results of fatty acid composition of lipid extracts of wheat, corn and sunflower harvest residues

PhAgroWaste

In line with the EU and national priorities in waste management, PhAgroWaste has been designed as a multidisciplinary project aimed to evaluate the agricultural waste as a source of various raw materials for pharmaceutical, chemical and food industry.

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Aknowlegment: This research was supported by the Science Fund of the Republic of Serbia, #Grant No 7752847, Value-Added Products from Maize, Wheat and Sunflower Waste as Raw Materials for Pharmaceutical and Food Industry - PhAgroWaste.