FATTY ACID COMPOSITION OF HEMP-BASED FOOD PRODUCTS

IBSC International BioScience Conference November Novi Sad, Serbia 2021

Introduction

- Rising popularity and market presence of hemp-based food products has emphasized the need for detailed characterization of their nutritional composition. In food industry the mostly exploited raw material are hemp fruits, which are commonly named “seeds”. Hemp seeds after cold pressing result in hemp seed oil, leaving a cake which after grinding contains hemp protein.
- All of these products – seeds, oils, and proteins, are source of fatty acids.

Material and Method

- Hemp-based food products were obtained from European countries during 2018–2021. Thirty-five products were classified as cold pressed hemp seed oil (19 samples), hemp seed (5 unpeeled and 4 peeled) and hemp protein (7 samples).
- In case of seeds and proteins, sample preparation included extraction of fats using Soxhlet apparatus prior to esterification of fatty acids to methyl esters, which enabled their GC-MS profiling.
- The intake of fatty acids was calculated based on the recommended usage data available on product’s label and expressed per average portion (oil 15 g, seed 20 g, protein 20 g).

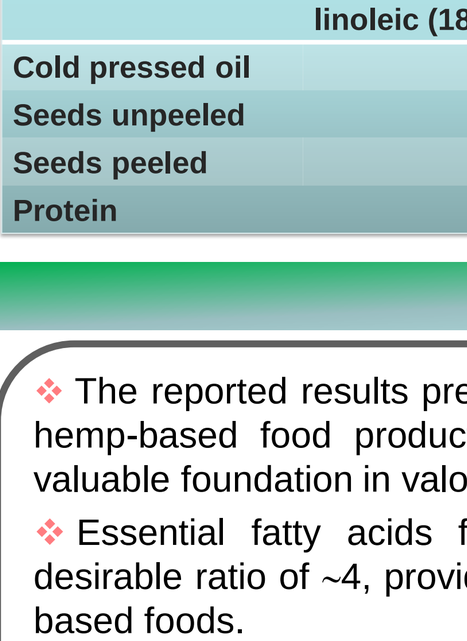
Results

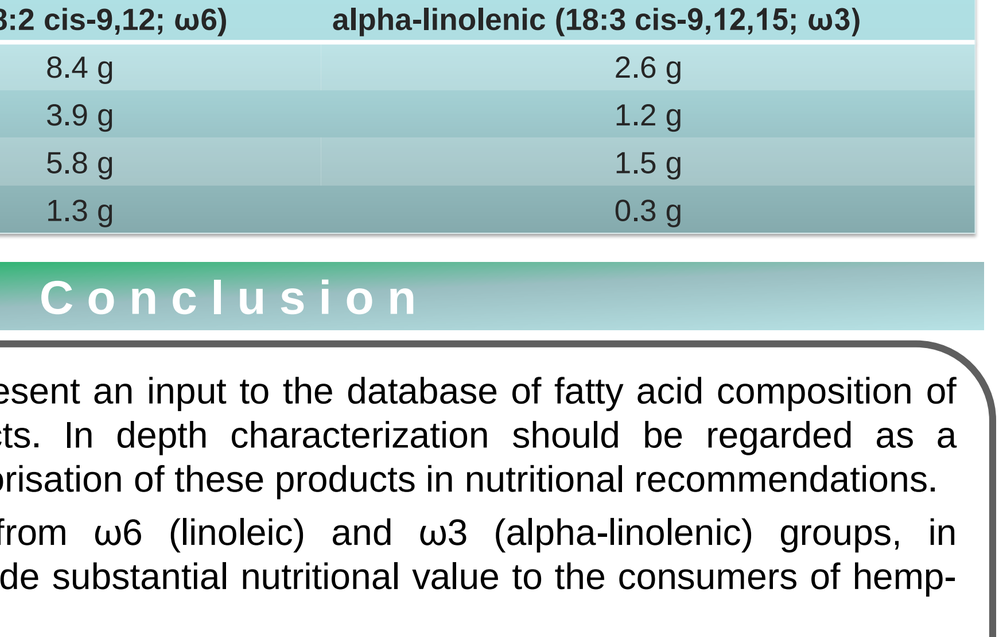
- Fat content of hemp seeds was 34.7 and 51.2% in unpeeled and peeled samples, respectively, while in proteins was 11.3% (mean levels).
- Composition of most abundant individual fatty acids and characteristic groups of fatty acids in cold pressed hemp seed oil and seed and protein fat portion, presented in Figure 1 (A) and (B), respectively, shows great similarity, as expected, with dominance of ω6 PUFA. Content of characteristic groups of fatty acids in hemp seeds and proteins as whole products is presented in Figure 1 (C).
- A portion of hemp-based food product boasts an abundance of essential fatty acids:

	linoleic (18:2 cis-9,12; ω6)	alpha-linolenic (18:3 cis-9,12,15; ω3)
Cold pressed oil	8.4 g	2.6 g
Seeds unpeeled	3.9 g	1.2 g
Seeds peeled	5.8 g	1.5 g
Protein	1.3 g	0.3 g

Conclusion

- The reported results present an input to the database of fatty acid composition of hemp-based food products. In depth characterization should be regarded as a valuable foundation in valorisation of these products in nutritional recommendations.
- Essential fatty acids from ω6 (linoleic) and ω3 (alpha-linolenic) groups, in desirable ratio of ~4, provide substantial nutritional value to the consumers of hemp-based foods.
- The necessary prerequisite is safety of these products, above all in terms of contamination with cannabinoids, a class of terpenophenolic compounds with psychoactive potential.





Objectives

- To study and compare composition of fatty acids (FA) and characteristic groups of fatty acids in different hemp-based food products available to the consumers in European countries
- To estimate intake of nutritionally valuable fatty acids.

SFA – saturated	***ω3FA – omega 3***
MUFA - monounsaturated	***ω6FA – omega 6***
PUFA – polyunsaturated	***ω9FA – omega 9***

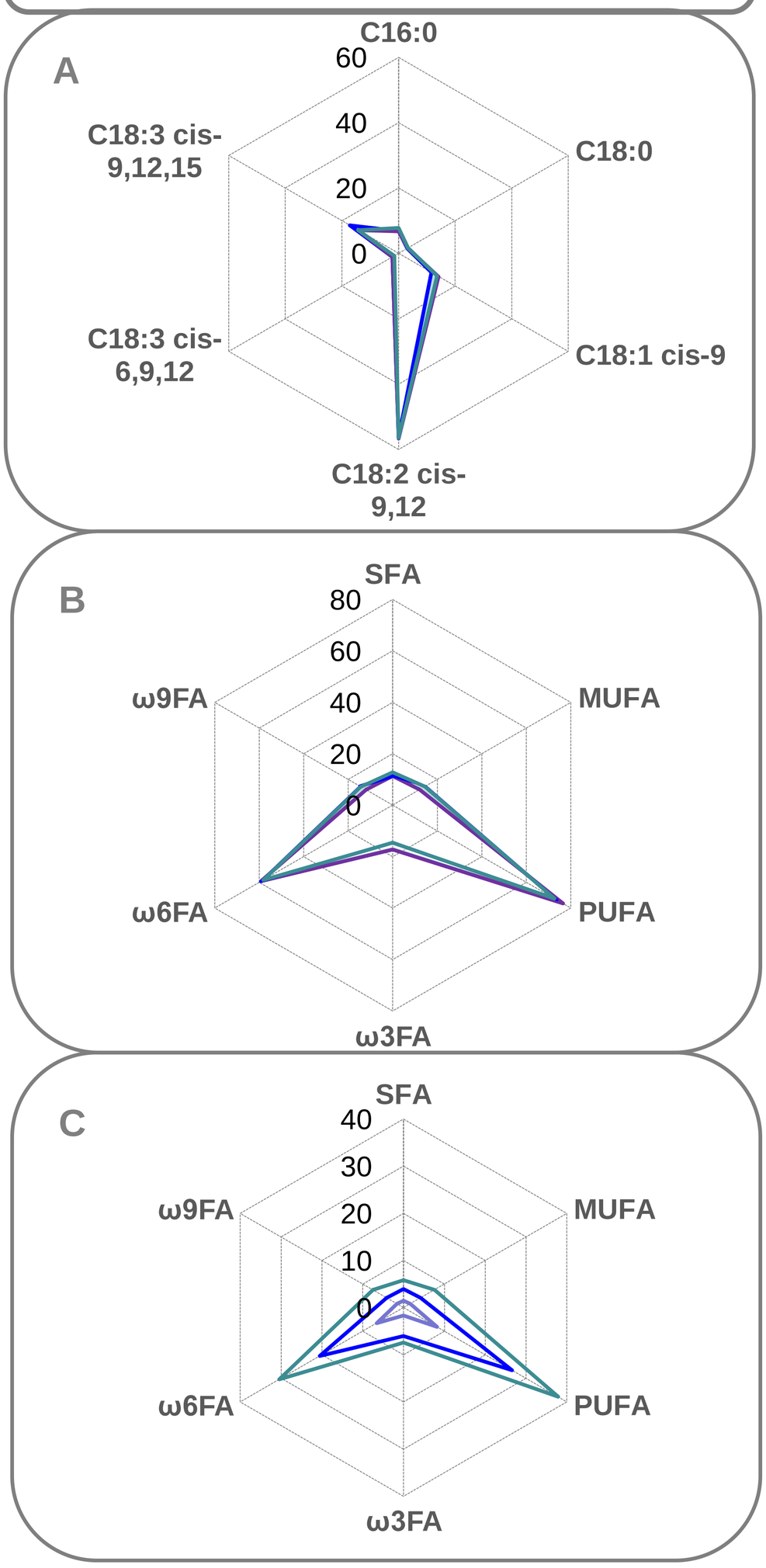


Figure 1.
Composition of most abundant individual fatty acids (A) and characteristic groups of fatty acids (B) in cold pressed hemp seed **oil** and seed (**unpeeled** and **peeled**) and **protein** fat portion;
Fatty acids content of hemp seeds (**unpeeled** and **peeled**) and **protein** (C)

Ljilja Torović[1,2]
Nebojša Kladar[1,3]

ljilja.torovic@mf.uns.ac.rs

[1]University of Novi Sad, Faculty of Medicine, Department of Pharmacy, Serbia,
[2]Institute of Public Health of Vojvodina, Novi Sad, Serbia,
[3] University of Novi Sad, Faculty of Medicine, Center for Medical and Pharmaceutical Investigations and Quality Control, Serbia