



PROGRAM
BOOK

XXII Congress

EuroFoodChem

June 14-16, 2023 | Belgrade, Serbia

<https://xxiieurofoodchem.com>

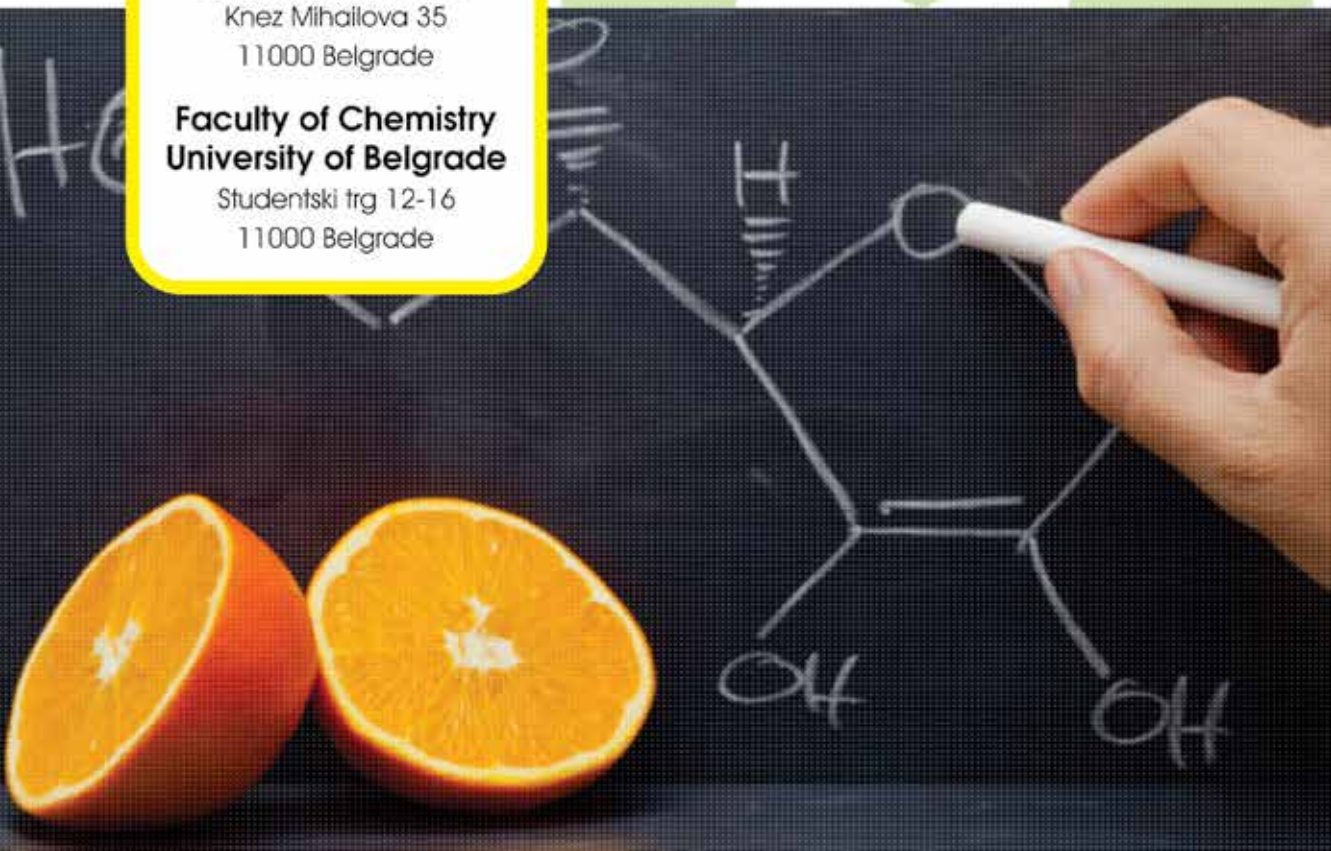
congress2023@xxiieurofoodchem.com

**Serbian Academy of
Sciences and Arts**

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**Faculty of Chemistry
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XXII Congress EuroFoodChem

**June 14-16, 2023
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WELCOME ADDRESSES

Under the auspices



Ministry of Science, Technological
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Serbian Academy of
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EuChemS, Division of Food Chemistry



Serbian Chemical Society

Dear Colleagues and Friends,

On behalf of the Food Chemistry Division of EuChemS and Serbian Chemical Society with support of the Serbian Academy of Sciences and Arts, I am delighted to welcome all the experts from different countries to Belgrade, Serbia to XXII EuroFoodChem.

Following the previous successful meetings of EuroFoodChem since 1981, Belgrade is for the first time honored to host this important international gathering in the field of food chemistry.

After a very successful virtual edition in 2021, we are thrilled to organize a face-to-face meeting again.

The Congress program offers both exciting recent trends in food chemistry research and engaging networking opportunities that we all have missed over the last couple of years. In addition to abstract presentations and lectures by world renowned speakers, we will be offering a variety of networking options. The EuroFoodChem is an excellent opportunity for initiating or strengthening cooperations and knowledge.

For centuries Serbia has been strategically the most important region in the Balkans; many conquerors fought for this piece of land and left their own traces in time and space. We can only hope that the rich and tightly packed scientific program will allow you to explore the capital of Serbia and historical places nearby.

Serbia is a country of diversities and the city of Belgrade, as a place of intersection of different cultures and history, is the most beautiful example of it. Wine making has a long tradition in Serbia and it is now experiencing its renaissance. Vineyards have been a part of the diverse Serbian landscape since before the times of Romans. Belgrade is also a new hot spot on the European gastronomical map. In a city with so many historical influences, tradition intertwines with innovation.

I would also like to thank all of you who have worked with devotion on putting up this meeting together. On behalf of all of us involved in the event preparation, I wish you a great time at EuroFoodChem, and thank you for your participation and contribution to the high scientific quality of the event.

Hope that you will find the Congress and your stay in Belgrade valuable, enjoyable, and memorable!

Congress Chairman

Tanja Ćirković Veličković

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CONGRESS TOPICS

- **Food composition, quality, and safety**
- **Food sustainability, including byproducts valorization**
- **Novel foods**
- **Food and health, functional foods, and ingredients**
- **Chemical reactions and interactions of food components**
- **Chemical changes in food under processing and storage**
- **Food adulteration, authenticity, and traceability**
- **Novel methods for food chemistry**
- **Food contaminants**

GENERAL INFORMATION

Official Language:

English. No simultaneous translation will be provided:

Registration Desk opening times.

Day 1: June 14, 2023, 8:30-10:30h

Day 2: June 15, 2023, 8:30-10:30h

Day 3: June 16, 2023, 8:30-10:30h

**The Registration Desk is situated in Serbian Academy of Sciences and Arts
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Liability and Insurance: Neither the Food Chemistry Division of EuChemS nor the local organizers will assume any responsibility whatsoever for damage or injury to persons or property during the Congress. Participants are recommended to arrange for their personal travel and health insurance.

Certificate of Attendance: Will be given at the registration desk and sent by email after the end of the Congress.

Changes of volatiles, free fatty acids and antioxidant profiles in gluten-free sponge cakes with the powdered cocoa bean shell (CBS)

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Nowadays, the value of agricultural by-products has received increasing attention due to economic reasons and the environmental problem with organic wastes. According to the statistics, more than 250 thousand tons of cocoa bean shell (CBS) is produced in Europe [1], and on a global scale, the amount of CBS is even higher. Our study aimed to assess the impact of CBS powder on the functional properties of a gluten-free sponge cake as an innovative approach to cocoa by-product valorisation. For this purpose, the profile of volatile compounds, free fatty acids, and antioxidant properties of gluten-free sponge cakes with 5, 10, 20 and 30% addition of CBS powders of different particle sizes (100 and 200 µm) was evaluated (Fig. 1). The solid phase microextraction (SPME) with gas chromatography-mass spectrometry (GC-MS) was used to study the profile of volatile compounds, whereas Photochem® kit (Analytic Jena, Germany) was devoted to analyse the lipid-soluble antioxidants ability to scavenge against superoxide anion radicals (O₂⁻). The free fatty acid composition was determined from lipids extracted by the Folch method. Fatty acid methyl esters were separated using the gas chromatograph equipped with a flame ionization detector (GC-FID). Several volatile components were identified in the sponge cakes with CBS addition. They belong to the chemical classes of alcohols, aldehydes, furfural and pyrazine derivatives (e.g. 2,3- and 2,6- dimethylpyrazine, methyl-, trimethyl-, tetramethylpyrazine). The occurrence of pyrazines, which possess a nutty and sweet odour, in these bakery products might influence positively the aroma perception and potentially increase their acceptance among consumers. The *cis/trans*-oleic acid, palmitic acid, and linoleic acid were the three domain fatty acids in the studied samples. Their content was identified at the range of 49.42- 53.71, 15.78-20.49, and 18.72-14.55%, respectively. Furthermore, the highest antioxidative activity was observed in sponge cakes with 30% CBS addition. Irrespective of the particle size of CBS powders, the antioxidant activity determined in the sponge cakes with CBS100 and CBS200 ((7.67±0.24 and 7.25±0.09 Trolox equiv. mmol/L, respectively) was almost 3-times higher in comparison to the control (2.72±0.11 TE mmol/L). In conclusion, the addition of CBS to gluten-free sponge cakes is a promising ingredient to achieve a product of higher biological activity and pleasant flavour.



Fig.1. Images of cocoa bean shell (CBS) and gluten-free sponge cakes with 5% of CBS addition with 100 µm (on the left) and 200 µm (on the right).

Acknowledgments: The research visit of Veronika Barišić PhD in the Institute of Animal Reproduction and Food Research was granted from EIT Food Fellowship 2022 program (under supervision of Małgorzata Starowicz PhD and Małgorzata Wronkowska PhD).

References:

- [1] Rojo-Poveda, O.; Barbosa-Pereira, L.; Zeppa, G.; Stévigny, C. Cocoa Bean Shell—A By-Product with Nutritional Properties and Biofunctional Potential. *Nutrients* 2020, 12, 1123. <https://doi.org/10.3390/nu12041123>

The influence of integral and organic growing systems on sugar content in selected tomato types and cultivars

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Interest in production of protected crops has grown significantly over the past decade. Different cultivation systems (conventional, integral, and organic) affect the biological activity, which is ultimately reflected in the high quality of the fruits of different vegetable crops. In accordance with the requirements for health-safe products without residues of harmful substances in fruits, there is an increasing need for the production of tomatoes in integral and organic production systems. One of the most important features of these vegetables is their high quality and health safety, high nutritional and biological value. Agricultural production systems and growing practices are critical factors in determining the nutritional quality of tomato fruits [1]. In tomato, the sugar content is one of the important factors and one of the most significant parameters from the aspect of food quality [1]. Therefore, the aim of this work is to monitor fluctuations in sugars content, as parameters that determine the nutritional value in tomato cultivars, induced by growing under integral and organic conditions. For this purpose, a set of sixteen samples of four types of tomatoes - beef, grapolo, mini and midi plum, and cherry - was analyzed. Each type of tomato included two varieties, grown in two agricultural systems - integral and organic. The sugars profile was obtained using High-Performance Anion Exchange Chromatography with Pulsed Amperometric Detection (HPAEC-PAD). The content of eleven sugar components was determined. Fructose and glucose were the major sugar compounds [2], while the sugar microcomponents were trehalose, arabinose, melibiose, sucrose, isomaltose, gentiobiose, raffinose, maltose, and panose. The results showed differences between samples produced in integral and organic growing systems, primarily in micro-sugar components. Higher content of trehalose and melibiose was found in samples obtained from organic production.

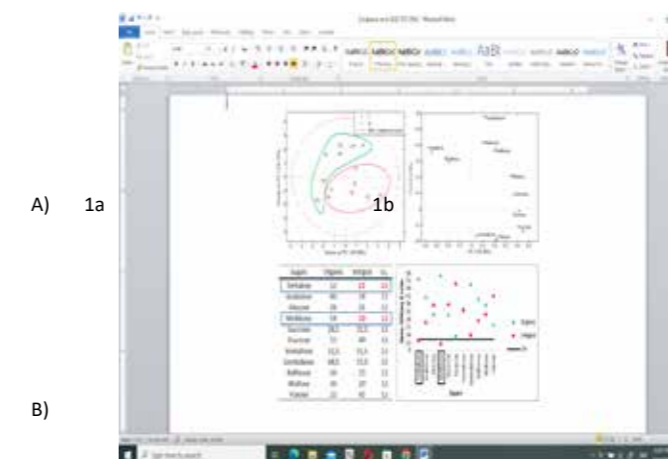


Fig.1. Principal Component Analysis (A)- The difference between integral (I) and organic (O) type of production; score plot (1a) – tomato samples: integral samples (I) 9-14, organic samples (O) 1-8, and loading plot (1b), and results of the Mann-Whitney U test (B) - sugar markers of type of production.

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References:

- [1] E. Rosa-Martínez, M. D. García-Martínez, A. M. Adalid-Martínez, L. Pereira-Dias, C. Casanova, E. Soler, M. Rosario Figas, M. Dolores Raigon, M. Plazas, S. Soler, J. Prohens, *Food Research International*, 147 (2021) 110531.
[2] C. Agius, S. von Tucher, B. Poppenberger, W. Rozhon, *MethodsX*, 5 (2018). 537-550.

IMPRESUM

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Za izdavača:

Prof. dr Tanja Ćirković Veličković

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2023. godina

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