



BOOK
OF
ABSTRACTS

XXII Congress

EuroFoodChem

June 14-16, 2023 | Belgrade, Serbia

<https://xxiieurofoodchem.com>

congress2023@xxiieurofoodchem.com

**Serbian Academy of
Sciences and Arts**

Knez Mihailova 35
11000 Belgrade

**Faculty of Chemistry
University of Belgrade**

Studentski trg 12-16
11000 Belgrade



COMMITTEES

Chair: Tanja Ćirković Veličković, Corresponding Member of
Serbian Academy of Sciences and Arts

SCIENTIFIC COMMITTEE

Joana Amaral (Portugal) – Chair, EuChemS-FCD
Marco Arlorio (Italy) – Past-Chair, EuChemS-FCD
Livia Simonné Sarkadi (Hungary)
Todasca Cristina (Romania) – Secretary, EuChemS-FCD
Hans Jacob Skarpeid (Norway)
Karel Cejpek (Czech Republic)
Matthias Wüst (Germany)
Małgorzata Starowicz (Poland)
Michael Murkovic (Austria) – Treasurer, EuChemS-FCD
Slavica Ražić (Serbia) – EuChemS Executive Board Member
Zuzana Ciesarova (Slovakia)
Reto Battaglia (Switzerland)
Irena Vovk (Slovenia)
Andreja Rajkovic (Serbia & Belgium)

LOCAL ORGANIZING COMMITTEE

Dušanka Milojković-Opsenica (University of Belgrade – Faculty of Chemistry, Serbia)
Jelena Radosavljević (University of Belgrade – Faculty of Chemistry, Serbia)
Jelena Mutić (University of Belgrade – Faculty of Chemistry, Serbia)
Jelena Trifković (University of Belgrade – Faculty of Chemistry, Serbia)
Mirjana Radomirović (University of Belgrade – Faculty of Chemistry, Serbia)
Petar Ristivojević (University of Belgrade – Faculty of Chemistry, Serbia)
Maja Krstić Ristivojević (University of Belgrade – Faculty of Chemistry, Serbia)
Ivana Prodić (Institute of Molecular Genetics and Genetic Engineering, Serbia)
Elizabet Janić Hajnal (University of Novi Sad, Institute of Food Technology in Novi Sad, Serbia)
Danijela Kostić (University of Niš, Faculty of Sciences and Mathematics)

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
Knez Mihailova 35, 11000 Belgrade**

LOCAL ORGANIZER

PCO – ARIA Conference & Events doo

Karadjordjev trg 34 – 11080 Zemun – Belgrade, Serbia
Office: + 381 11 2600 978
Mail: office@aria.co.rs
www.ariaconference.com

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.

From Data mining to Meta-analysis: Presence of mycotoxins in food.

Zita E. Martins^{1,*}, Marta Silva¹, Armindo Melo^{1,2}, Catarina Mansilha^{1,2}, Miguel A. Faria¹, Isabel M.P.L.V.O. Ferreira¹

¹LAQV/REQUIMTE, Laboratory of Bromatology and Hydrology, Department of Chemical Sciences, Faculty of Pharmacy, University of Porto, Porto, 4050-313, Portugal

²Instituto Nacional de Saúde Dr. Ricardo Jorge, Departamento de Saúde Ambiental, Rua Alexandre Herculano 321, Porto, 4000-055, Portugal

* zmartins@ff.up.pt

Mycotoxins occurrence in food is an important topic regarding the actual human health risk and considering the climate changes that will likely contribute to an increase of these toxicants' outbreaks in food. In addition, the human co-exposure to multiple mycotoxins is a real problem, increasing the concern about their combined impact on health, as reported by Rodrigues and Naehrer [1]. Mycotoxins can exert several deleterious effects, with carcinogenicity being one of the most impacting which lead to the classification of some molecules by the International Agency for Research on Cancer (IARC) [2].

The goal of this work was to perform a systematic review (from 2000 to 2022) using FoodMine's code [3], with some modifications to improve mining and collect data concerning the prevalence of Aflatoxin B1 (AFB1, group 1), Fumonisin B1 (FB1, group 2B), Deoxynivalenol (DON, group 3), Beauvericin (BEA, no classification) in 10 foods from different origins, and then perform a meta-analysis to assess whether the mycotoxins prevalence and mean values represent a risk in these foods.

Results for food samples varied among mycotoxins, as observed in Fig.1. For AFB1, 3% (CI_{95%} - 0-12%, I²=79%) were contaminated, with a mean value of 27.11 µg/kg (CI_{95%} - 10.42-70.53 µg/kg, I²=94%). With B1, 44% (CI_{95%} - 6-89%, I²=79%) were contaminated, having a mean value of 94.60 µg/kg (CI_{95%} - 19.69-454.59 µg/kg, I²=100%). As for DON, 68% (CI_{95%} - 67-68%, I²=91%) appeared contaminated, presenting a mean value of 207.74 µg/kg (CI_{95%} - 145.71-296.19 µg/kg, I²=100%). Finally, 80% (CI_{95%} - 28-98%, I²=14%) were contaminated with BEA, with a mean value of 16.28 µg/kg (CI_{95%} - 1.25-212.73 µg/kg, I²=99%).

These results may be concerning when compared with the maximum levels permitted in food by the European Union (2-12 µg/kg for AFB1, 200-4000 µg/kg for Fumonisin, and 200-1752 µg/kg for DON) [4]. Although no limits are established for BEA, its high prevalence should not be overlooked. This study highlights the importance of monitoring mycotoxins to ensure the safety and quality of food products and protect consumers from contamination.

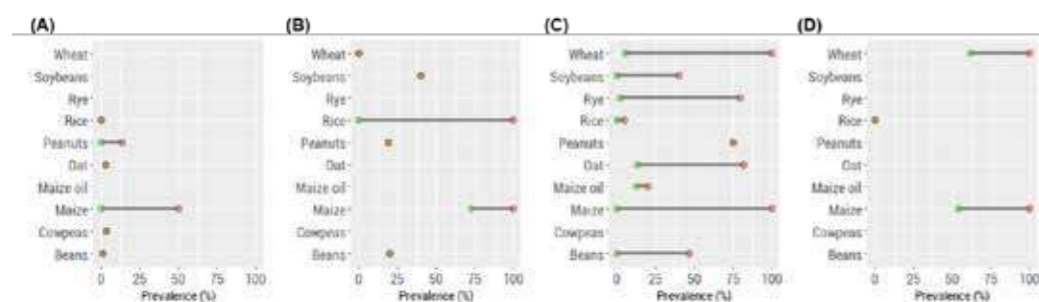


Fig.1. Mycotoxins prevalence among studies for the different foods. (A) AFB1, (B) FB1, (C) DON, and (D) BEA.

Funding: This work was financial supported by CCDRN through projet NORTE-01-0145-FEDER-000052, intituled: Healthy&ValorFOOD.

Acknowledgments: This work received support and help DIETxPOSOME project (PTDC/SAU-NUT/6061/2020). FCT for the Ph.D. Grant 2020.05266.BD (Marta Silva). FCT/MEC the researcher contract (Miguel Faria)

References:

- [1] I. Rodrigues, K. Naehrer, *Toxins*, 4 (2012) 663.
- [2] V. Ostry, F. Malir, J. Toman, Y. Grosse. *Mycotoxin Research*, 33 (2017) 65.
- [3] F. Hooton, G. Menichetti, A.L. Barabási, *Scientific Reports*, 10 (2020) 16191.
- [4] EC 1881/2006. Official Journal of the European Union. (2006) 5.

Binding and corona formation of ovalbumin to polystyrene and polyethylene terephthalate microplastics under neutral and acidic conditions

Nikola Gligorijevic^{1,2}, Dragana Stanic-Vucinic³, Tamara Mutic³, Tamara Lujic³, Tanja Cirkovic Velickovic^{3,4,5,6,*}

¹University of Belgrade - Institute for Chemistry, Technology and Metallurgy, National Institute of the Republic of Serbia, Department of Chemistry, Belgrade, Serbia

²University of Belgrade - Faculty of Chemistry, Belgrade, Serbia

³Centre of Excellence for Molecular Food Sciences, Department of Biochemistry, University of Belgrade - Faculty of Chemistry, Belgrade, Serbia

⁴Ghent University Global Campus, Yeonsu-gu, Incheon, South Korea

⁵Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium

⁶Serbian Academy of Sciences and Arts, Belgrade, Serbia

*tcirkov@chem.bg.ac.rs

Microplastic represents one of the major types of pollutants in modern era. Over several years of research in the field of microplastic, there are still many unknown gaps, including the effects and mechanisms of action of these particles on human health. Studies in this field conducted experiments on cells and human tissues or animals like rats and mice. While these studies suggest the toxic effects of microplastic, it is not clear if concentrations used for exposure are relevant for humans. Also, most of the studies used spherical polystyrene, which does not reflect well the diversity of microplastic particles found in nature. Another gap is lack of studies describing direct interactions of microplastics and proteins. While it is generally known that proteins form corona around microplastic particles, affinity studies and consequences on protein structure are usually missing.

The aim of this work was to analyze interaction of a major egg white protein and allergen, ovalbumin to several to microplastic particles, including polystyrene (PS) of 120 and 500 µm in size and polyethylene terephthalate (PET) of 120 µm in size. Binding affinity was determined at both acidic, pH 3 and neutral, pH 7 conditions, at the room temperature, by measuring bulk ovalbumin concentration in supernatants at the equilibrium time. Several binding models, including Langmuir, Freundlich, Redlich-Peterson and Guggenheim-Anderson-de Boer (GAB), were used to determine binding parameters. The formation of soft and hard corona was analyzed according to the published protocol [1]. Structural analysis was performed using near and far-UV CD spectrometry.

Obtained results showed that ovalbumin binds to both PS and PET. All binding models indicated that ovalbumin binds with higher affinity to tested microplastics on pH 3, compared to pH 7, with the highest affinity being calculated for PS 120 µm. Further analysis showed that ovalbumin forms both soft and hard corona onto the surface of all three microplastics. Structural alterations of ovalbumin as a consequence of its interaction with microplastic was shown to be both pH and microplastic type dependent. Also, more pronounced effect on its tertiary structure was observed, compared to secondary. At pH3, tertiary structure of bulk ovalbumin becomes destabilized, especially in the presence of PET 120 µm and PS 500 µm, while at pH 7, structural stabilization is observed, especially in the presence of PS 120 µm.

Considering that the microplastic was discovered in eggs [2], obtained results suggest that direct interactions of native ovalbumin with microplastic particles could have influence on its structure and thus affect its techno-functional properties.

Acknowledgments: This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 96517.

References:

- [1] D. Magri, P. Sánchez-Moreno, G. Caputo, F. Gatto, M. Veronesi, G. Bardi, T. Catelani, D. Guarnieri, A. Athanassiou, P.P. Pompa, D. Fragouli, *ACS Nano*, 12 (2018) 7690-7700.
- [2] Q. Liu, Z. Chen, Y. Chen, F. Yang, W. Yao, Y. Xie, *Food Chemistry*, 397 (2022) 133771.

IMPRESUM

Izdavač:

Srpsko hemijsko društvo, Karnegijeva 4, Beograd 11000

Za izdavača:

Prof. dr Tanja Ćirković Veličković

Godina izdavanja:

2023. godina

Urednik:

Tanja Ćirković Veličković

Dizajn, priprema i štampa:

Štamparija "Caligraf soft",
Kosovska 6, 11080 Zemun

Tiraž: 250 primeraka

978-86-7132-083-2

CIP - Каталогizacija u publikaciji Narodna
biblioteka Srbije, Beograd

663/664(048)

577.1(048)

CONGRESS EuroFoodChem (22 ; 2023 ; Beograd)

Abstract Book [Elektronski izvor] / XXII Congress EuroFoodChem,
June 14-16, 2023, Belgrade, Serbia ;

urednik Tanja Ćirković Veličković. - Beograd :

Srpsko hemijsko društvo, 2023 (Zemun :

Caligraf soft). - 1 USB fleš memorija ;

6 x 9 cm (u obliku kartice)

Sistemske zahteve: Nisu navedeni. - Nasl. sa

naslovne strane dokumenta. - Tiraž

250.

ISBN 978-86-7132-083-2

a) Храна -- Апстракти b) Биохемија -- Апстракти

COBISS.SR-ID 118007817