



University of Belgrade - Faculty of Agriculture

1st European Symposium on
Phytochemicals in Medicine and Food
(1-EuSPMF)

Book of abstracts

Belgrade, Serbia
7-9 September 2022

**University of Belgrade - Faculty of Agriculture
Univerzitet u Beogradu - Poljoprivredni fakultet**

Zbornik izvoda radova/Book of Abstracts

1st EUROPEAN SYMPOSIUM ON PHYTOCHEMICALS IN MEDICINE AND FOOD

Urednici/ Editors

Dr Miloš B. Rajković, full professor
Dr Jelena B. Popović-Đorđević, full professor
Dr Aleksandar Ž. Kostić, associate professor

Izdavač/Publisher

University of Belgrade-Faculty of Agriculture
Belgrade, Serbia

Za izdavača/For the publisher

dr Dušan Živković, full professor

Glavni i odgovorni urednik/Chief and responsible editor

dr Tamara Paunović, assistant professor

Tehnička priprema/Technical assistance

Slobodan Đorđević

Dizajn/Design

Daniela Popović-Beogračić

Štampa/Printed by

Maks printing, Beograd-Zemun

Tiraž/Printed in

80 copies

ISBN 978-86-7834-408-4

Odlukom Odbora za izdavačku delatnost Poljoprivrednog fakulteta Univerziteta u Beogradu od 02.09.2022. godine, br. 231/19, odobreno je izdavanje Zbornika izvoda radova sa Simpozijuma "1st European Symposium on Phytochemicals in Medicine and Food (1-EuSPMF)"

*Zabranjeno preštampavanje i fotokopiranje. Sva prava zadržava izdavač

Beograd-Zemun
2022. godina

CHAIRMAN

Prof. dr Jelena Popović-Dorđević
University of Belgrade-Faculty of Agriculture
Belgrade, Serbia

Prof. dr Esra Capanoglu
Istanbul Technical University, Faculty of Chemical and Metallurgical Engineering
Istanbul, Turkey

CO-CHAIRMAN

Prof. dr Goran Kaluđerović
University of Applied Sciences Merseburg
Merseburg, Germany

Prof. dr Maria da Graça Campos
University of Coimbra, Faculty of Pharmacy
Coimbra, Portugal

Prof. dr Avi Shpigelman
Technion, Faculty of Biotechnology and Food Engineering
Haifa, Israel

SCIENTIFIC COMMITTEE

Chairman

Jelena Popović-Djordjević, Serbia	Jesus Simal-Gandara, Spain
Avi Shpigelman, Israel	Jianbo Xiao, Spain
Charalampos Proestos, Greece	Jing Wang, China
Dušan Sladić, Serbia	Luiz Fernando Cappa de Oliveira, Brazil
Dušanka Milojković Opsenica, Serbia	Maria da Graça Campos, Portugal
Esra Capanoglu, Turkey	Marina Soković, Serbia
Fatih Oz, Turkey	Maurizio Battino, Italy
Goran Kaluđerović, Germany	Mirjana Pešić, Serbia
Gulcin Sagdicoglu Celep, Turkey	Mohamed Ali Farag, Egypt
Haroon Khan, Pakistan	Robert Verpoorte, Netherlands
Hui Cao, China	Shaoping Nie, China
Haiyan Gao, China	Sina Siavash Moghaddam, Iran
Hesham El-Seedi, Sweden	Thomas Efferth, Germany
Ilkem Demirkesen Mert, Turkey	Vibor Roje, Croatia
Irena Vovk, Slovenia	Viktor Nedović, Serbia
Jelena Katanić Stanković, Serbia	Živoslav Tešić, Serbia

LIST OF PRESENTATION

PLENARY LECTURES		Page
I_PL	Robert Verpoorte, Y.H. Choi Food for health, food for thought	1
II_PL	Li Yang, <u>Jianbo Xiao</u> Myricetin ameliorated prediabetes via immunomodulation and gut microbiota interaction	2
III_PL	Hesham R. El-Seedi Plants mentioned in the Islamic Scriptures and 5700 years ago: Traditional uses and medicinal importance in contemporary time	3
IV_PL	María G. Campos Drug-Herb Interactions as a cause of therapeutic failure or toxic events: Oncology examples of Case Reports	4
V_PL	Maurizio Battino Unraveling the molecular mechanisms underlying the health effects of dietary bioactive compounds	5
VI_PL	Rachel Levi, Or Shapira, Inbal Hanuka Katz, Zoya Okun, <u>Avi Shpigelman</u> Stability of anthocyanins during processing and shelf life: potential implication to processed products	6
VII_PL	A.E.Giannakas, C.E. Salmas, E.Kollia, A. Kopsacheili, C. Birlia, <u>C. Proestos</u> Use of essential oil from plants to produce nanostructures as active packaging materials for the food industry	7
VIII_PL	<u>Esra Capanoglu</u> , Elifsu Nemli, Francisco Tomas-Barberan Valorization of agricultural wastes: Novel approaches and applications	8
IX_PL	Jesus Simal-Gandara Untargeted and targeted metabolomics	9
INVITED LECTURES		
I_IL1	Marina Soković Bioactivity from bioworld	10
I_IL2	Filip Andrić Towards the most desirable natural products and their bioactivity features using multicriteria decision making methods and linear regression/classification algorithms	11
II_IL1	Goran N. Kaluđerović Natural compounds immobilized into mesoporous silica	12
II_IL2	<u>Olgica Nedić</u> , Nikola Gligorijević, Ana Penezić, Simeon Minić, Mirjana Radomirović, Milan Nikolić, Tanja Ćirković Veličković Food antioxidants and their interaction with human proteins	13
III_IL1	Gordana Stojanović Medicinal plants - Traditional application in South-Eastern Serbia	14
IV_IL1	<u>Maria Daglia</u> , Hammad Ullah, Alessandra Baldi, Alessandro Di Minno Brewer's spent grain extract rich in dietary fibers and postprandial glycemia and insulin response in healthy subjects: a monocentric, randomized, cross-over, double-blind, placebo-controlled clinical trial	15
IV_IL2	A. Gulcin Sagdicoglu Celep The role of polyphenols in preventive nutrition	16



II_IL1_Food antioxidants and their interaction with human proteins

Olgica Nedić¹, Nikola Gligorijević¹, Ana Penezić¹, Simeon Minić², Mirjana Radomirović², Milan Nikolić², Tanja Ćirković Veličković^{2,3}

¹ Institute for the Application of Nuclear Energy, Department for Metabolism, University of Belgrade, Banatska 31b, 11080 Belgrade, Serbia; e-mail: olgica@inep.co.rs

² Center of Excellence for Molecular Food Sciences, Department of Biochemistry, University of Belgrade - Faculty of Chemistry, Studentski trg 12-16, 11000 Belgrade, Serbia

³ Serbian Academy of Sciences and Arts, Knez Mihailova 35, 11000 Belgrade, Serbia

Health, disease and ageing are tightly connected with a redox balance. Oxidative stress underlines diabetes, cardiovascular, neurological and other diseases. Edible plants contain an array of compounds which express antioxidative activity, directly correlated with their structure capable of accommodating or releasing electrons. These compounds are often not freely soluble in an aqueous medium, such as human plasma, and interact with host molecules. Ligand-protein (L-P) complexes enable solubilization of ligands at higher concentrations and transport, prolonging their half-life and utility.

Our research work was focused on interactions between resveratrol (R) and fibrinogen [1], (dihydro)alpha-lipoic acid (ALA) and fibrinogen or albumin [2,3], and phycocyanobilin (PCB) and catalase [4]. Resveratrol is found in grapes and berries, leafy greens are a source of ALA and alga *Spirulina* is a source of PCB. L-P interactions were investigated by following-up structural changes of proteins and/or ligands using spectrometric methods (spectrofluorimetry, CD, FTIR) and by examining the primary role of individual proteins upon ligand binding. Common to all complexes were stable secondary and tertiary structures of proteins accompanied by thermal stabilization in the case of albumin-dihydroALA. L-P interactions were non-covalent and of the order of magnitude 10^4 M^{-1} . A mutually protective effect against both resveratrol and fibrinogen oxidation was found when they formed a complex, while the solubility of resveratrol greatly increased in an aqueous environment. No effect was seen on the coagulation process. Fibrinogen with bound DHLA was also protected from oxidation and formed fibrin with thicker fibres, which may be beneficial for persons with an increased risk of thrombotic complications. PCB-catalase complex protected the pigment from oxidation, enabling prolongation of its half-life and bioactivity. Since only some proteins bind ligands and specific ligands bind only to some proteins, the distribution of plant antioxidants between human proteins under physiological conditions is an intriguing task for investigation.

References

1. Gligorijević, N. et al., *Foods*, 2020, 9, 780.
2. Gligorijević, N. et al., *International Journal of Biological Macromolecules*, 2020, 147, 319-325.
3. Gligorijević, N. et al., *Journal of the Serbian Chemical Society*, 2021, 86, 795-807.
4. Gligorijević, N. et al., *Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy*, 2021, 251, 119483.