



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

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Izdavač/Publisher

University of Belgrade-Faculty of Agriculture
Belgrade, Serbia

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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)"

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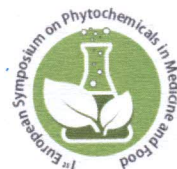
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II_IL1_Food antioxidants and their interaction with human proteins

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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.

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