

# BOOK of ABSTRACTS



International Conference  
on Advanced Production and Processing

**2<sup>nd</sup> International Conference  
on Advanced Production and Processing  
20<sup>th</sup>-22<sup>nd</sup> October 2022  
Novi Sad, Serbia**

**Title:**

Book of Abstracts of the 2<sup>nd</sup> International Conference on Advanced Production and Processing publishes abstracts from the following fields: Innovative Food Science and Bioprocesses, Nutraceuticals and Pharmaceuticals, Sustainable Development, Chemical and Environmental Engineering, Materials Design and Applications, Petroleum Refining and Production.

**Publisher:**

University of Novi Sad, Faculty of Technology Novi Sad,  
Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

**For publisher:**

prof. Biljana Pajin, PhD, Dean

**Editorial board:**

Jovana Petrović, Ivana Nikolić, Milica Hadnađev Kostić, Snežana Škaljac, Milana Pribić, Bojan Miljević, Branimir Pavlić, Olga Govedarica

**Editor-in-Chief:**

Prof. Zita Šereš, PhD

**Design and Printing Layout:**

Saša Vulić

CIP - Каталогizacija u publikaciji  
Biblioteke Matice srpske, Novi Sad

658.5(048.3)

INTERNATIONAL Conference on Advanced Production and Processing (2 ; 2022 ; Novi Sad)  
Book of abstracts [Elektronski izvor] / 2nd International Conference on Advanced Production and Processing, 20th-22nd October 2022, Novi Sad ; [editor-in-chief Zita Šereš]. - Novi Sad : Faculty of Technology, 2022

Način pristupa (URL): <https://www.tf.uns.ac.rs/download/icap-2022/book-of-abstracts.pdf>. - Opis zasnovan na stanju na dan 14. 10. 2022. - Nasl. s naslovnog ekrana.

ISBN 978-86-6253-160-5

a) Tehnologija - Proizvodnja - Apstrakti

COBISS.SR-ID 77341961



**2<sup>nd</sup> International Conference  
on Advanced Production and Processing  
20<sup>th</sup>-22<sup>nd</sup> October 2022  
Novi Sad, Serbia**

## CONFERENCE CHAIRMAN

Prof. Biljana Pajin, Dean of the Faculty of Technology Novi Sad

## HONORARY COMMITTEE

### **Professor Marijana Carić,**

Emeritus Professor at University of Novi Sad, Serbia

### **Professor Radmila Marinković Nedućin,**

Emeritus Professor at University of Novi Sad, Serbia

### **Professor Miodrag Tekić,**

Emeritus Professor at University of Novi Sad, Serbia

### **Professor Vladimir Srdić,**

Corresponding member of Serbian Academy of Sciences and Arts,

Faculty of Technology Novi Sad, University of Novi Sad, Serbia

### **Professor Jasna Čanadanović–Brunet,**

highest cited professor at Faculty of Technology

Novi Sad, University of Novi Sad, Serbia

---

## ORGANISING COMMITTEE

from the Faculty of Technology Novi Sad, University Novi Sad, Serbia

Prof. Zita Šereš

Prof. Jaroslav Katona

Prof. Nataša Đurišić Mladenović

Prof. Lidija Petrović

Prof. Jelena Pejin

Prof. Dragan Govedarica

Prof. Senka Vidović

Prof. Jelena Pavličević

Prof. Bojana Ikonić

Prof. Ljiljana Popović

Prof. Marija Milanović

Prof. Ivana Nikolić

Prof. Milica Hadnađev Kostić

Prof. Olga Govedarica

Prof. Jadranka Fraj

Prof. Senka Popović

Prof. Marija Jokanović

Prof. Zorica Stojanović

Branimir Pavlić, Assistant Professor

Uroš Miljić, Assistant Professor

Snežana Škaljac, Senior Research Associate

Sanja Panić, Senior Research Associate

Bojan Miljević, Senior Research Associate

Jovana Petrović, Research Associate

Mirjana Petronijević, Research Associate

Vesna Vasić, Research Associate

Ana Đurović, Research Associate

Aleksandra Cvetanović Kljakić, Research Associate

Nataša Nastić, Research Associate

Ljiljana Spasojević, Research Assistant

Jelena Tanasić, Research Assistant

Andrea Nesterović, Research Assistant

Milana Pribić, Teaching Assistant

Julijana Blagojević, Teaching Assistant

Jelena Škrbić, Research Trainee

Sonja Stojanov, Research Trainee

## SCIENTIFIC COMMITTEE

- Prof. Viktor Nedović, Faculty of Agriculture, University of Belgrade, Serbia
- Prof. Zorica Knežević-Jugović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia
- Anamarija Mandić, Principal Research Fellow, Institute of Food Technology in Novi Sad, University of Novi Sad, Serbia
- Prof. Verica Dragović-Uzelac, Faculty of Food Technology and Biotechnology, University of Zagreb, Croatia
- Prof. Dragana Šoronja Simović, Faculty of Technology Novi Sad, University of Novi Sad, Serbia
- Prof. Sandra Budžaki, Faculty of Food Technology, Josip Juraj Strossmayer University of Osijek, Croatia
- Prof. Sonja Smole Možina, Biotechnical Faculty, University of Ljubljana, Slovenia
- Prof. Drago Šubarić, Faculty of Food Technology, Josip Juraj Strossmayer University of Osijek, Croatia
- Prof. Zsuzsanna László, Faculty of Engineering, University of Szeged, Hungary
- Prof. Aleksandra Tepić Horecki, Faculty of Technology Novi Sad, University of Novi Sad, Serbia
- Vesna Đorđević, Principal Research Fellow, Institute of Hygiene and Meat Technology, Belgrade, Serbia
- Prof. Małgorzata Korzenowska, Wrocław University of Environmental and Life Sciences, Poland
- Prof. Cecilia Hodúr, Faculty of Engineering, University of Szeged, Hungary
- Prof. Gordana Dimitrovska, Faculty of Biotechnical Sciences, University "St. Kliment Ohridski", Bitola, Macedonia
- Prof. Borislav Malinović, Faculty of Technology, University of Banja Luka, Bosnia and Herzegovina
- Prof. Zoran Zeković, Faculty of Technology Novi Sad, University of Novi Sad, Serbia
- Prof. Ljijana Đekić, Faculty of Pharmacy, University of Belgrade, Serbia
- Prof. Predrag Putnik, Department of Food Technology, University of the North, Croatia
- Prof. Rita Ambrus, Inst. of Pharmaceutical Technology and Regulatory Affairs Faculty of Pharmacy, University of Szeged, Hungary
- Prof. Vlada Veljković, Corresponding Member of Serbian Academy of Sciences and Arts, Faculty of Technology in Leskovac, University of Niš, Serbia
- Perica Bošković, Assistant Professor, Faculty of Chemistry and Technology, University of Split, Croatia
- Prof. Olivera Stamenković, Faculty of Technology in Leskovac, University of Niš, Serbia
- Prof. Gülsün Akdemir Evrendilek, Bolu Abant İzzet Baysal University, Bolu, Turkey
- Marinella Farré, Principal Research Fellow, Institute of Environmental Assessment and Water Research, CSIC, Barcelona, Spain
- Prof. João Crespo, NOVA School of Science and Technology, Universidade Nova de Lisboa, Portugal
- Prof. Zoran Petrović, Full member of Serbian Academy of Sciences and Arts, Kansas Polymer Research Center, Pittsburg State University, Pittsburg, USA
- Prof. Vladimir Srdić, Corresponding member of Serbian Academy of Sciences and Arts, Faculty of Technology Novi Sad, University of Novi Sad, Serbia
- Prof. Branka Pilić, Faculty of Technology Novi Sad, University of Novi Sad, Serbia
- Branko Matović, Principal Research Fellow, Vinča Institute of Nuclear Sciences, University of Belgrade, Serbia,
- Prof. Ana Brás, Faculty of Engineering and Technology, Liverpool John Moores University, United Kingdom
- Lucretia Miu, Principal Research Fellow, National Research & Development Institute for Textile and Leather, Bucharest, Romania
- Polonca Ropret, Principal Research Fellow, Head of Research Institute at Institute for the Protection of Cultural Heritage of Slovenia, University of Ljubljana, Slovenia
- Prof. Alexander Knyazev, Chemical Faculty, Lobachevsky State University of Nizhni Novgorod, Russia
- Prof. Dmitry Grishin, Full member of Russian Academy of Sciences, Lobachevsky State University of Nizhni Novgorod, Russia
- Prof. Blaž Likozar, National Institute of Chemistry, Slovenia



## **EFFECTS OF SELENIUM NANOPARTICLES ON PATHOGENIC AND PROBIOTIC FOOD BACTERIA, AND THEIR INFLUENCE ON HUMAN INTESTINAL CELLS**

***Nina Tomić<sup>1</sup>, Nenad Filipović<sup>1</sup>, Dragana Mitić Culafić<sup>2</sup>, Ana Djokić<sup>3</sup>, Magdalena Stevanović<sup>1</sup>***

<sup>1</sup>*Institute of Technical Sciences of SASA, Knez Mihailova 35/IV 11000 Belgrade, Serbia*

<sup>2</sup>*University of Belgrade, Faculty of Biology, Studentski trg 16, 11158, Belgrade, Serbia*

<sup>3</sup>*Institute of Rheumatology, Resavska 69, 11000 Belgrade, Serbia*

Selenium is an especially important element for the functioning of antioxidative enzymes, making it one of the essential micronutrients. Although selenium is required in extremely small amounts, often it is lacking from the organism. However, inorganic and organic sources of selenium are known to possess considerable toxicity. Recently, the nanoparticle form of selenium has been shown to exhibit lesser toxicity, and also better antimicrobial and other biological effects, than selenium-containing compounds. Nanotechnology has already found application in many fields, for improving material properties for various purposes, among them, in the process of improving food characteristics. It is possible that selenium nanoparticles can be applied as antimicrobial agents in food, and there has been growing interest in this area of research. We have synthesized selenium nanoparticles (SeNPs) by chemical reduction method, using sodium selenite, ascorbic acid, and bovine serum albumin. The antimicrobial activity of these particles has been assessed by minimum inhibitory concentration assay and colony-forming units count, on *Listeria monocytogenes* and *Salmonella enterica*, which are common bacterial food contaminants. As intestinal microbiota, especially probiotic bacteria, have been shown to play important role in organism functioning, we also tested how SeNPs influence *Lactobacillus rhamosus* and *Lactobacillus plantarum*. To evaluate cytotoxicity, we used MTT assay on the human intestinal cell line (HT-29). Antioxidative properties were assessed by DPPH assay. SeNPs showed higher antibacterial activity on pathogenic bacteria than on probiotic strains. Cytotoxic effect was present only in the highest tested concentrations. The antioxidative activity was considerable, resulting in above 80% reduction of DPPH free radical, at 1 µg/ml of SeNPs. Based on these results, SeNPs are a promising subject for further research in developing materials for food packaging or as antimicrobial selenium additives.

*Keywords: Selenium nanoparticles, Antibacterial, Antioxidative, Probiotic*

*Acknowledgements: Funds for the realization of this work were provided by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Agreement on realization and financing of scientific research work of the Institute of Technical Sciences of SASA in 2021 (Record number: 451-03-9/2021-14/ 200175), and grant number 451-03-68/2022-14/ 200178.*