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**3rd** Faculty of Medicine Osijek

# **YOUNG SCIENTISTS' DAY - Book of Abstracts**

**Conference of Young Scientists**

Josip Juraj Strossmayer University of Osijek - Faculty of Medicine Osijek - Faculty of Dental Medicine and Health Osijek  
- Faculty of Food Technology Osijek - Department of Biology Osijek - Department of Physics Osijek -  
Department of Chemistry Osijek - Faculty of Agrobiotechnical Sciences Osijek



## **3<sup>rd</sup> YOUNG SCIENTISTS' DAY – Conference**

OSIJEK, November 30<sup>th</sup>, 2021

FACULTY OF MEDICINE JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK,  
JOSIPA HUTTLERA 4, OSIJEK

## **BOOK OF ABSTRACTS**

ORGANISED BY

Josip Juraj Strossmayer University of Osijek

Faculty of Medicine Osijek

Faculty of Dental Medicine and Health Osijek

Faculty of Food Technology Osijek

Department of Biology Osijek

Department of Physics Osijek

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**Editor**  
Ines Drenjančević

**Proofreading**  
Ana Stupin  
Ines Bilić Čurčić

**Cover page**  
Silvija Šafranko  
Stela Jokić

**Technical editing**  
Boris Stanković  
Mirna Osmanagić



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## **3<sup>rd</sup> YOUNG SCIENTISTS' DAY – Conference**

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## **SCIENTIFIC PROGRAMME**

# Conference Programme of 3<sup>rd</sup> Young Scientists' Day

November 30<sup>th</sup>, 2021 - Registration

8:30 – 9:00 Participants registration

9:00 – 9:30 Opening ceremony

9:30 – 10:30 Section I.

## Section I.

**Moderators:** Ines Bilić Čurčić, associate professor; Ivana Majić, full professor; Elvira Kovač- Andrić, associate professor

9:30 – 9:40 Elementi ponašanja kao rani biomarkeri izloženosti / **Behavioural elements as the early biomarkers of exposure** (T. Đerdđ, D. K. Hackenberger, D. K. Hackenberger, B. K. Hackenberger) – Department of Biology Osijek

9:40 – 9:50 Nacionalno istraživanje prehrambenih navika dojenčadi i male djece 2017-21 / **Food Consumption Survey in Infants and Children in Croatia 2017-2021** (L. Šoher, M. Pavlić, M. Jurković, D. Sokolić, D. Kenjerić) – Faculty of Food Technology Osijek

9:50 – 10:00 Utjecaj vrste i strukture krmiva na razvoj probavnog sustava, proizvodne pokazatelje i metabolički profil teladi / **Influence of type and structure of feed on digestive system development, production indicators and metabolic profile of calves** (M. Ronta) – Faculty of Agrobiotechnical Sciences Osijek

10:00 – 10:10 Razvoj nove metode bazirane na elektroforezi na mikročipu za detekciju β-alanina i L-histidina u dijetetskim suplementima / **Development of new microchip electrophoresis method for detection of β-alanine and L-histidine in dietary supplements** (I. Pukleš, N. Sakač, B. Matasović, B. Šarkanj, M. Jozanović) – Department of Chemistry Osijek

10:10 – 10:20 Kofein u energetskim napitcima i njegovi zdravstveni učinci / **Caffeine in energy drinks and its health effects** (N. Pavlović, K. Vitale, S. Jokić, M. Miškulin, I. Miškulin) – Faculty of Medicine Osijek

10:20 – 10:30 Novi tipovi zadataka u tradicionalnoj nastavi fizike / **New types of physics problems in traditional setting** (D. Kuveždić, G. Planinšić) – Department of Physics Osijek

10:30 – 11:00 Coffee Break

## Section II.

**Moderators:** Martina Smolić, full professor; Selma Mlinarić, assistant professor; Tanja Žuna Pfeiffer, associate professor

11:00 – 11:10	Raznolikost zajednice makrozoobentosa u planinarskim vodotocima Parka prirode Papuk, Hrvatska / <b>The presence and distribution of freshwater macroinvertebrates in mountain streams of Papuk Nature Park, Croatia</b> (V. Ergović, D. Čerba, M. Koh, I. Turković Čakalić, M. Mitrović) – Department of Biology Osijek
11:10 – 11:20	Tjelesna aktivnost i procjena боли u donjem dijelu leđa kod studenata sestrinstva i fizioterapije / <b>Physical activity and evaluation of lower back pain in students of nursing and physiotherapy</b> (K. Rožac, Š. Mikšić, A. Grgić) – Faculty of Dental Medicine and Health Osijek
11:20 – 11:30	Imunološki odgovori i endotelna aktivacija nakon 7-dnevne visokoslane dijetе u zdravih, mladih pojedinaca / <b>Immune Responses and Endothelial Activation Following 7-Day High-Salt Diet in Young Healthy Individuals</b> (A. Knezović, N. Kolobarić, I. Drenjančević, Z. Mihaljević, P. Šušnjara, I. Jukić, M. Stupin, A. Kibel, S. Marczi, M. Mihalj, A. Stupin) – Faculty of Medicine Osijek
11:30 – 11:40	Razina oksidacijskog stresa u uvjetima intenzivnog fizičkog napora u lovačkih pasmina pasa / <b>The level of oxidative stress in conditions of intense physical effort in hunting dog breeds</b> (I. Parčetić- Kostelac, M. Šperanda, T. Florijančić, I. Bošković, D. Bešlo, N. Poljičak Milas, T. Kopačin) – Faculty of Agrobiotechnical Sciences Osijek
11:40 – 11:50	Zadovoljstvo poslom medicinskih sestara i tehničara koji izrađuju i postavljaju immobilizacije u Hrvatskoj / <b>Job Satisfaction of Nurses Technicians who Make and Apply Immobilizations in Croatia</b> (M. Gašić, Š. Mikšić) – Faculty of Dental Medicine and Health Osijek

## Section III.

**Moderators:** Igor Lukačević, associate professor; Đurđica Ačkar, full professor; Martina Medvidović-Kosanović, associate professor

11:50 – 12:00	Proizvodnja lipaze porjeklom iz Thermomyces lanuginosus: optimiranje i uvećavanje mjerila bioprosesa / <b>Lipase production from Thermomyces lanuginosus: optimization and scale-up of the bioprocess</b> (D. Šibalić, M. Tišma) – Faculty of Food Technology Osijek
12:00 – 12:10	Teorijsko modeliranje perovskitnih heterostruktura ZnO - BaTiO <sub>3</sub> / <b>Theoretical modelling of perovskite heterostructures ZnO - BaTiO<sub>3</sub></b> (I. Kovač, I. Lukačević, M. Mužević, M. Varga Pajtler) – Department of Physics Osijek

12:10 – 12:20	Utjecaj narušenja Lorentzove invarijancije na visokoenergetske gama spektre astrofizikalnih izvora / <b>Influence of Lorentz invariance violation on very high energy gamma-ray spectra from astrophysical sources</b> (J. Strišković) – Department of Physics Osijek
12:20 – 12:30	Uporaba anorganskih oksida u fotokatalizi / <b>Application of inorganic oxides in photocatalysis</b> (M. Terzić, P. Živković, J. Kojčinović, D. Tatar, M. Korica, E. Kovač-Andrić) – Department of Chemistry Osijek
12:30 – 12:40	Taloženje kalcijeva oksalata monohidrata i dihidrata s galnom kiselinom / <b>Precipitation of calcium oxalate monohydrate and dihydrate with gallic acid</b> (S. Goman, S. Šafranko, D. Goman, S. Jokić, M. Medvidović-Kosanović, A. Stanković) – Department of Chemistry Osijek
12:40 – 12:50	Procjena toksičnosti aktivne tvari azoksistrobin i komercijalnog pripravka (Quadris®) na ne ciljni organizam tla Enchytraeus albidus / <b>Toxicity evaluation of the active ingredient azoxystrobin and a commercial product (Quadris®) on the non-target soil organism Enchytraeus albidus</b> (M. Kovačević, N. Stjepanović, D.K. Hackenberger, B.K. Hackenberger) – Department of Biology Osijek
12:50 – 13:50	<b>Lunch Break</b>

#### Section IV.

<b>Moderators:</b> Marina Poje Sovilj, assistant professor; Martina Medvidović-Kosanović, associate professor; Davor Seifert, associate professor	
13:50 – 14:00	Preliminarna histološka analiza dva biomaterijala nakon prezervacije alveole / <b>Preliminary histological analysis of two biomaterials after socket preservation</b> (M. Tomas, M. Čandrlić, M. Juzbašić, M. Matijević, Ž. Perić Kačarević) – Faculty of Dental Medicine and Health Osijek
14:00 – 14:10	Asocijativna analiza fenotipskih svojstava heksaploidne pšenice i molekularnih markera / <b>Association analysis of phenotypic traits and molecular markers in hexaploid wheat</b> (S. Kujundžić, S. Vila) – Faculty of Agrobiotechnical Sciences Osijek
14:10 – 14:20	Ekstrakcija bioaktivnih spojeva iz duhanskog otpada / <b>Extraction of bioactive compounds from tobacco waste</b> (M. Banožić, S. Jokić) – Faculty of Food Technology Osijek
14:20 – 14:30	Kemijski sastav organskog industrijskog otpada / <b>Chemical composition of some industrial organic waste</b> (M. Tkalec Kojić, T. Vinković, B. Popović, Z. Lončarić, N. Parađiković) – Faculty of Agrobiotechnical Sciences Osijek

14:30 – 14:40	Razvoj senzora za potenciometrijsko određivanje tiabendazola / <b>Development of the sensor for the potentiometric determination of thiabendazole</b> (K. Bubnjar, M. Budetić, M. Samardžić, A. Dandić, P. Živković, A. Széchenyi, L. Kiss) – Department of Chemistry Osijek
14:40 – 14:50	Senzorske mogućnosti ultratankih BaTiO <sub>3</sub> nanostruktura prema ugljikovim oksidima temeljene na optičkim signalima / <b>Sensing capabilities of ultrathin BaTiO<sub>3</sub> nanostructures toward carbon oxides based on optical signals</b> (M. Mužević, I. Lukačević, M. Varga Pajtler) – Department of Physics Osijek

## Section V.

**Moderators:** Lidija Begović, assistant professor; Zvonko Antunović, full professor; Marina Poje Sovilj, assistant professor

14:50 – 15:00	Mikrofiti u poplavnom području Kopačkog rita / <b>Microphytes in the floodplain area of Kopački Rit</b> (N. Bek, T. Žuna Pfeiffer, D. Špoljarić Maronić, F. Stević) – Department of Biology Osijek
15:00 – 15:10	Optimalno opremanje poljoprivrednih gospodarstava sredstvima poljoprivredne mehanizacije / <b>Optimal equipment of agricultural farms by means of agricultural mechanization</b> (D. Zimmer, L. Šumanovac, M. Jurišić) – Faculty of Agrobiotechnical Sciences Osijek
15:10 – 15:20	Model parcijalne ravnoteže stočarske proizvodnje u Republici Hrvatskoj / <b>Partial equilibrium model of livestock production in the Republic of Croatia</b> (D. Kranjac, K. Zmaić, E. Erjavec) – Faculty of Agrobiotechnical Sciences Osijek
15:20 – 15:30	Nalaz oblića Contracaecum sp. u babuškama ( <i>Carassius gibelio</i> Bloch, 1782) / <b>Presence of Contracaecum sp. parasites in the Prussian carp (<i>Carassius gibelio</i> Bloch, 1782)</b> (N. Vučić, I. Turković Čakalić, I. Vukšić, D. Čerba) – Department of Biology Osijek

## Section VI.

**Moderators:** Stela Jokić, full professor; Ana Stupin, associate professor; Maja Varga Pajtler, assistant professor

15:30 – 15:40	Primjena kakaove ljske u proizvodnji čokolade / <b>Application of cocoa shell in production of chocolate</b> (V. Barišić, I. Flanjak, Đ. Ačkar) – Faculty of Food Technology Osijek
15:40 – 15:50	Inkapsulacija polifenolnih i hlapivih spojeva soka aronije na prehrambena vlakna / <b>Encapsulation of phenolic and volatile</b>

	<b>compounds from chokeberry juice onto dietary fibers</b> (I. Buljeta, A. Pichler, J. Šimunović, M. Kopjar) – Faculty of Food Technology Osijek
15:50 – 16:00	Elektrokemijska detekcija polifenola u realnim uzorcima / <b>Electrochemical detection of polyphenols in real samples</b> (A. Plasajec, D. Glavašević Arbutina, D. Goman, A. Stanković, M. Medvidović-Kosanović) – Department of Chemistry Osijek
16:00 – 16:10	Gastropretekivni učinak spojeva ekstarkta češnjaka na epitelno oštećenje izazvano natrijevim taurokolatom u staničnom modelu ulkusne bolesti / <b>Gastoprotective effect of garlic extracts to the epithelial damage caused by sodium taurocholate in a cell culture model of ulcer disease</b> (L. Kuna, M. Zjalić, T. Kizivat, H. Roguljić, V. Ninčević, T. Omanović Kolarić, A. Včev, M. Smolić, R. Smolić) – Faculty of Dental Medicine and Health Osijek
16:10 – 16:20	Procjena uloge ionskih kanala u mehanizmima dilatacije karotidne arterije izazvane protokom miševa Tff3 <sup>-/-</sup> C57BL/6N i njihovih kontrola divljeg tipa na prehrani s malo soli i visokoj soli / <b>Assessment of the role of ion channels in flow-induced dilation mechanisms of a carotid artery in low salt and high salt fed Tff3<sup>-/-</sup>C57BL/6N mice and their wild type controls</b> (N. Kozina, I. Drenjančević, I. Jukić) – Faculty of Medicine Osijek

## Section VII.

	<b>Moderators:</b> Ines Drenjančević, full professor; Branko Dmitrović, full professor; Zorana Katanić, assistant professor
16:20 – 16:30	Karakterizacija lipaza iz Burkholderia cepacia i Pseudomonas fluorescens / <b>Characterization of lipases from Burkholderia cepacia and Pseudomonas fluorescens</b> (M. Ostojčić, S. Budžaki, I. Strelec) – Faculty of Food Technology Osijek
16:30 – 16:40	Inhibicija biosinteze glikolipida utječe na inzulinsku signalizaciju / <b>Inhibition of glycolipid biosynthesis affects insulin signalling</b> (M. Zjalić, M. Heffer) – Faculty of Medicine Osijek
16:40 – 16:50	Molekularni mehanizmi bubrežnog učinka liraglutida na stanični model proksimalnih tubularnih stanica / <b>Molecular mechanisms of renal effect of Liraglutide on cellular model of proximal tubular cells</b> (V. Ninčević, T. Omanović Kolarić, M. Zjalić, L. Kuna, M. Smolić, A. Včev, I. Bilić Ćurčić) – Faculty of Dental Medicine and Health Osijek
16:50 – 17:00	$\gamma\delta^{hi}$ i $\gamma\delta^{int}$ T stanične linije nesrazmjerno su promijenjene u krvi i koži pacijenata s vulgarnom psorijazom / <b>The <math>\gamma\delta^{hi}</math> and <math>\gamma\delta^{int}</math> T cell subsets and disproportionately altered in blood and skin of vulgar psoriasis patients</b> (M. Jirouš, M. Štefanić, M. Šola, B. Viljetić, T. Opačak-

	Bernardi, V. Plužarić, M. Mihalj, K. Glavaš, M. Tolušić Levak, P. Balogh, S. Tokić) – Faculty of Medicine Osijek
17:00 – 17:10	Varijante gena za progesteronski receptor u modulaciji rizika spontanog prijevremenog porođaja / <b>Genetic variations of progesterone receptor in modulation of risk for spontaneous premature birth</b> (M. Kadivnik, K. Kralik, A. Muller, S. Šijanović, J. Wagner Kostadinović) – Faculty of Medicine Osijek
17:10 – 17:20	Trajni pozitivan učinak edukacijske intervencije na znanje i stavove o kemoprevenciji raka dojke / <b>Sustained positive effect of educational intervention on breast cancer chemoprevention knowledge and attitudes</b> (S. Vukadin, K. Bojanic, F. Šarčević, K. Grgić, L. Malenica, K. Kralik, R. Smolić, M. Smolić) – Faculty of Dental Medicine and Health Osijek

### **3<sup>rd</sup> Young Scientists' Day - Conference Closing**

17:20-17:30

**Conclusions and Conference Closing**

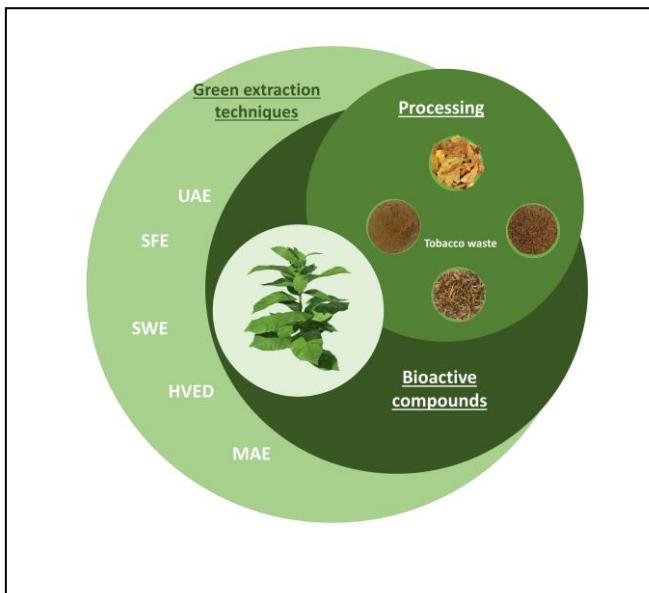
# Ekstrakcija bioaktivnih spojeva iz duhanskog otpada

## Extraction of bioactive compounds from tobacco waste

M. Banožić<sup>1</sup>, S. Jokić<sup>1</sup>

<sup>1</sup>Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek, Franje Kuhača 18, 31000 Osijek, Croatia.

\*corresponding\_author: mbanozic@ptfos.hr



Industrial waste is a growing problem across the world. Its accumulation has enormous environmental but also economic and social consequences. The tendency to reduce industrial waste has resulted in the development of new technologies that utilize by-products for various purposes. Tobacco is one of the most cultivated plants in the world. Considering the high amounts of processed tobacco, it is not surprising that large quantities of waste are generated. Industrial tobacco waste usually includes midrib, broken leaf parts and tobacco dust. Some of the proposed methods are the utilization of tobacco waste for energy purposes or production of reconstituted tobacco. But for such processes, it is necessary to pre-extract

certain compounds. Tobacco leaf contains about 3,000 different chemical compounds including aldehydes, alkaloids, organic acids, alcohols, esters, ketones and carbohydrates, and about 1,000 compounds are produced by the combustion of tobacco by smoking. Polyphenols, tannins, coumarins and flavonoids are produced as secondary metabolites in the plant and their concentration changes during tobacco processing and they directly affect the organoleptic properties of tobacco. All of them are present, in lower or higher concentrations in tobacco waste. Extraction of those compounds is possible with conventional or novel "green" extraction techniques. Conventional methods require high energy "input", including high consumption of harmful solvents, prolonged extraction time and high temperatures where degradation of thermolabile components are occurred. New "green" extraction techniques such as supercritical CO<sub>2</sub> extraction, microwave assisted extraction, ultrasound assisted extraction, high voltage electric discharge assisted extraction and subcritical water extraction avoid or reduce these disadvantage and allow greater extraction utilization. The aim of this paper is to give an overview of our results in the extraction of bioactive compounds from tobacco waste, limitations, possible applications and further investigations.

**Keywords:** tobacco waste, bioactive compounds, extraction

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