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Josip Juraj Strossmayer University of Osijek  
Faculty of Food Technology Osijek  
Faculty of Agriculture in Osijek  
Faculty of Medicine in Osijek  
Department of Chemistry  
Department of Biology

# BOOK OF ABSTRACTS

## 1<sup>st</sup> Young Scientist Day PhD Conference



14<sup>th</sup> June 2018

Aula of Josip Juraj Strossmayer University of Osijek





# **1<sup>st</sup> YOUNG SCIENTIST DAY – PhD Conference**

OSIJEK, 14<sup>th</sup> June 2018

AULA OF JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK  
TRG SVETOG TROJSTVA 3, OSIJEK

# **BOOK OF ABSTRACTS**

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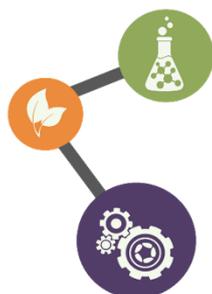


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**YOUNG**

**SCIENTIST DAY**

**1<sup>st</sup> YOUNG SCIENTIST DAY –  
PhD Conference**

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# **SCIENTIFIC PROGRAMME**

<b>8:30 – 9:00</b>	<b>Participant registration</b>
<b>9:00 – 9:30</b>	<b>Opening ceremony</b>
<b>9:30 – 11:20</b>	<b>Section I.</b>
	<i>Moderators: M. Molnar, Z. Antunović, T. Kovač</i>
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<b>9:45-10:00</b>	<u>A. Vuković</u> , I. Štolfa-Čamagajevac, R. Vuković, M. Matić, Z. Lončarić <b>Influence of different selenium forms on the antioxidative status in wheat seedlings (<i>Triticum aestivum</i> L.)</b> Utjecaj različitih oblika selena na antioksidacijski status u klijancima pšenice ( <i>Triticum aestivum</i> L.)
<b>10:00-10:15</b>	<u>S. Guberac</u> , S. Petrović, A. Rebekić, S. Vila <b>Winter wheat and climate change adaptability – finding functional markers in elite wheat germplasm</b> Ozima pšenica i prilagodljivost na klimatske promjene – potraga za funkcionalnim markerima u elitnoj germplazmi pšenice
<b>10:15-10:30</b>	<u>I. Varga</u> , M. Antunović, Z. Lončarić, M. Pospšil, A. Kristek <b>Sugar beet root yield and quality in relation to different planting densities</b> Prinos i kvaliteta šećerne repe u različitoj gustoći sjetve
<b>10:30-10:45</b>	<u>Ž. Klir</u> , J. M. Castro-Montoya, J. Novoselec, J. Molkentin, M. Domacinovic, B. Mioc, U. Dickhoefer, Z. Antunovic <b>Influence of pumpkin seed cake and extruded linseed on milk production and milk fatty acid profile in Alpine goats</b> Utjecaj pogače sjemenki bundeve i ekstrudiranog lana na proizvodnju i masnokiselinski profil mlijeka alpskih koza
<b>10:45-11:00</b>	<u>K. Gvozdanić</u> , V. Margeta, I. Djurkin Kušec, K. Salajpal, S. Džijan, G. Kušec <b>Genetic authentication of meat from autochthonous pig breed by the use of microsatellite markers</b> Genetska autentifikacija mesa autohtone pasmine svinja primjenom mikrosatelitskih markera
<b>11:00-11:15</b>	<u>N. Bilić-Dujmušić</u> , A. Matić (ex. Čosić), R. Vuković, A. Stupin, L. Rašić, G. Kralik, Z. Kralik, I. Drenjančević <b>Positive effect of omega-3 enriched egg consumption on reducing oxidative stress level in young healthy women</b> Pozitivan utjecaj konzumacije omega-3 obogaćenih jaja na smanjenje razina oksidativnog stresa kod mladih zdravih ženskih ispitanica
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<b>12:35-12:50</b>	<u>M. Jakovljević</u> , P. Kuš, I. Jerković, M. Molnar, S. Jokić <b>GC-MS and LC-MS profiles of the supercritical fluid extracts of black poplar (<i>Populus nigra</i> L.) buds</b> Određivanje sastava superkritičnih CO <sub>2</sub> ekstrakata pupoljaka crne topole ( <i>Populus nigra</i> L.) primjenom GC-MS i LC-MS tehnika
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*Moderators: M. Nujić, I. Štofa Čamagajevac, I. Đerđ*

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- 14:00-14:15**    Ž. Lončarić, B.K.Hackenberger, D.K.Hackenberger  
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Primjena matričnih populacijskih modela u biologiji
- 14:15-14:30**    A. Galir Balkić  
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Taksonomija i trofička struktura zooplanktona te interakcije unutar hranidbene mreže
- 14:30-14:45**    B. Vlaičević, J. Vidaković  
*Structure and development of periphytic ciliate community in a Danube floodplain lake*  
Struktura i razvoj zajednice trepetljikaša perifitona u jezeru poplavnog područja Dunava
- 14:45-15:00**    M. Varga, I. Štofa Čamagajevac, J. Horvatić  
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Fiziološki odgovor vrste Lemna gibba L. na djelovanje ionskog koloidnog srebra
- 15:00-15:15**    I. Pivić-Kovačević, S. Matić, J. Barać, Ž. Salinger  
*Macular thickness changes in diabetic patients after uncomplicated phacoemulsification cataract surgery*  
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**15:15 – 15:50**    **Coffee break**

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**15:50 – 18:00**    **Section IV**

*Moderators: A. Stanković, K. Selthofer-Relatić, M. Jakovljević*

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- 16:05-16:20**    M. Komar, M. Molnar  
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Mehanizam djelovanja novosintetiziranih N-9-sulfonilpurinskih derivata
- 16:45-17:00**    P. Matić, Š. Ukić, L. Jakobek  
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Ravnotežna istraživanja adsorpcije flavan-3-ola na  $\beta$ -glukanu
- 17:00-17:15**    J. Bijelić, A. Stanković, B. Matasović, B. Marković, M. Bijelić, G. Štefanić, Ž. Skoko, Z. Jagličić, S. Zellmer, T. Preller, G. Garnweitner, I. Djerđ  
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- 17:15-17:30**    M. Hajduković, M. Samardžić  
*Functionalized carbon nanotubes as a new sensing material for cationic surfactant determination*  
Funkcionalizirane ugljikove nanocjevčice kao novi senzorski materijal za određivanje kationskih tenzida
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*Characterization of chlorogenic acids in different coffee varieties using electrochemical methods*  
Karakterizacija klorogenskih kiselina u različitim vrstama kave primjenom elektrokemijskih metoda
- 

**17:45 - 18:00**    **Short break**

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**18:00 – 18:30**    **Congress closing**

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**18:30 - 20:30**    **Garden party (Faculty of Food Technology, F. Kuhača 18, Osijek)**

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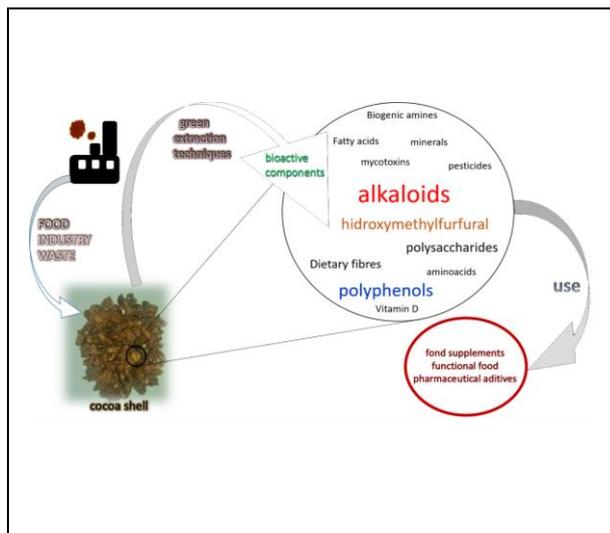
## Green extraction techniques of bioactive components from cocoa shell Zelene tehnike ekstrakcije bioaktivnih komponenata iz kakao ljuske

*N. Pavlović<sup>1,\*</sup>, M. Jakovljević<sup>2</sup>, M. Miškulin<sup>1</sup>, S. Jokić<sup>2</sup>*

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The food industry waste is often consisted from unedible parts, so-called by-products. Today, there are huge quantities of by-products that are discarded causing enormous economic problems by polluting the environment. The cocoa shell, as a by-product of the cocoa production industry, has also been discarded despite the fact that it contains some valuable bioactive components. Theobromine, caffeine and certain phenolic components migrate from cocoa bean to the shell, making it desirable raw material with a potential to be used in further processing. Apart from being eco-friendly, green extraction techniques are increasingly applied due to their simplicity and opportunity to preserve sensitive components

found in extracts. The aim of this study was to demonstrate how certain a type of extraction technique can give extracts with various bioactive components in different concentrations. Four green extraction techniques were used in this study: supercritical CO<sub>2</sub> extraction, ultrasonic assisted extraction, cold atmospheric plasma assisted extraction and extraction using deep eutectic solvents. Those modern techniques gave better yields of bioactive components and showed better antioxidant activity of the obtained extracts than classical Soxhlet extraction. The bioactive components in the obtained extracts were quantified by High Performance Liquid Chromatography. Supercritical CO<sub>2</sub> extraction gave higher yields for theobromine content, while ultrasonic assisted extraction with 50% aqueous ethanol solution gave the highest results for caffeine content and antioxidative activity. The extraction with a mixture of choline chloride: oxalic acid and 50% water gave at room temperature the highest total phenolic content. Cocoa shell, due to its nutritional value and bioactive components, has a potential to become a desirable raw material in a large spectrum of functional products and pharmaceutical products.

*Keywords: by-product, cocoa shell, extraction, bioactive compounds*

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