2025

SAFELI CONFERENCE

BOOK OF ABSTRACTS

Novi Sad, Serbia, October 31, 2025

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Title of the publication: SafeLi Conference 2025
Book of Abstracts

Editors: Dr Snežana Papović
MSc Teona Teodora Borović

Published by: University of Novi Sad, Faculty of Sciences
Trg Dositeja Obradovića 3, Novi Sad, Serbia

For publisher: Prof. Dr. Srđan Rončević, dean
University of Novi Sad, Faculty of Sciences

Printed by: Electronic material

Published at:

CIP - Каталогизација у публикацији
Библиотеке Матице српске, Нови Сад

621.352(048.3)

SAFELI Conference (2025 ; Novi Sad)
Book of abstracts [Elektronski izvor] / SafeLi Conference 2025, Novi Sad, Serbia, October 31, 2025 ; [editors Snežana Papović, Teona Teodora Borović]. - Novi Sad : Faculty of Sciences, 2025

Način pristupa (URL): https://safeliproject.com/conference. - Opis zasnovan na stanju na dan 17.11.2025.

ISBN 978-86-7031-724-6

a) Батерије -- Технологије -- Апстракти

COBISS.SR-ID 180045321

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*It is our great pleasure to welcome you to the **SafeLi Conference 2025**, organized within the framework of the project "New Ionic Additives for Safer and Durable Electrolytes in Lithium-Ion Batteries (SafeLi)", supported by the Science Fund of the Republic of Serbia.*

The SafeLi project addresses one of the key challenges in modern energy storage — enhancing the safety, stability, and lifetime of lithium-ion batteries. The project focuses on the development of innovative ionic additives for advanced electrolytes, aiming to improve both the thermal and electrochemical performance of next-generation batteries. By combining experimental research, computational modeling, and artificial intelligence methods, SafeLi explores new pathways for designing safer, more reliable, and durable electrolyte systems.

*The **SafeLi Conference 2025** provides a platform for researchers, students, and industry representatives to share their findings, exchange knowledge, and foster collaboration in the field of advanced battery technologies. The program includes oral and poster sessions covering a wide range of topics such as electrolyte design, battery safety, materials characterization, and intelligent approaches for materials optimization.*

*This **Book of Abstracts** brings together the contributions presented at the conference, showcasing the diversity and innovation within the SafeLi project and its broader research community. We hope it will serve as a useful reference and an inspiration for future scientific and technological advancements toward safer and more sustainable energy storage solutions.*

We extend our sincere gratitude to the Science Fund of the Republic of Serbia for its support, to all contributors for their valuable work, and to the organizing committee for their efforts in realizing this event.

We wish all participants a successful and inspiring conference.

SafeLi Conference 2025 team

SafeLi

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Enhance solubility of bioactive compounds via addition of polymers or ionic liquids

Tatjana Trtić-Petrović[1], Dajana Lazarević[1], Jelena Jovanović[1], Nada Ćujić Nikolić[2], Ksenija Kumrić[1], Katarina Šavikin[2], Katarina Stanković[3] and Goran Vladisavljević[3]
[1]Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Belgrade, 11351, Serbia
[2]Institute for Medicinal Plant Research Dr. Josif Pančić, Belgrade, 11000, Serbia
[3]Chemical Engineering Department, Loughborough University, Loughborough, Leicestershire

Presenting author email: ttrtic@vin.bg.ac.rs

One of the major challenges in the isolation and utilization of bioactive compounds (BACs) is their poor solubility in water. Increasing solubility, and thereby enhancing their extraction efficiency from biomass, is often achieved through the addition of chemical agents such as organic solvents and surfactants. However, these agents are frequently toxic, which drives the need for alternative, less harmful or non-toxic solutions.

The aim of this work was to improve the solubility of two groups of BACs—parthenolide and phenolic compounds from Tanacetum parthenium flowers, by adding polymers, and ellagic acid and phenolic compounds from raspberry pomace, by adding ionic liquids. Our results demonstrate that the extraction yield strongly depends on both the biomass particle size and the use of selected additives. Smaller particles, due to improved contact with the solvent, provided significantly higher yields.

To enhance the yield of parthenolide, a hydrophobic compound, we employed the polymer PPG 400. Increasing the PPG 400 concentration from 1 to 15% raised the parthenolide yield from 2.6 to 4.6 mg/g (Figure 1). Figure 1 demonstrates that the maximum yield of parthenolide is achieved through extraction with ethanol; however, the concentration of total phenols is five times higher when using 15% PPG 4000 compared to ethanol. The most pronounced effect on ellagic acid extraction was observed with surface-active ionic liquids, which increased the yield up to fivefold compared to water.

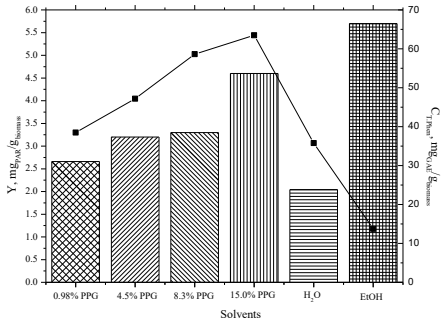

Figure 1. The effect of polymer concentration on the extraction yield of Parthenolide and total phenolic compounds.

These findings highlight the potential of polymers and ionic liquids as green and efficient alternatives for improving the solubility and extraction of poorly water-soluble bioactive compounds. Such approaches open new perspectives for sustainable isolation of natural products with enhanced applicability in pharmaceuticals and functional foods.

Acknowledgements: This research was supported by the Science Fund of the Republic of Serbia, Grant No 17475, Green Innovation: Unlocking the Bioactive Potential of Biomass for Enhanced Pharmaceuticals and Foods through Eco-Friendly Sustainable Technologies – VIVENDI, and the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia (451-03-136/2025-03/200017).