

**BOOK of ABSTRACTS**

**27<sup>th</sup> Congress  
of Chemists  
and Technologists  
of Macedonia**

**ХИМИЈА**

20-23 9 2024 OHRID, RN MACEDONIA





**Сојуз на хемичарите и технолозите на  
Македонија  
Society of Chemists and Technologists of  
Macedonia**

**27<sup>th</sup> Congress of SCTM**

# **BOOK of ABSTRACTS**

**25–28 September 2024  
Metropol Lake Resort  
Ohrid, N. Macedonia**

**Skopje, 2024**



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**Society of Chemists and Technologists of Macedonia**  
**25–28 September 2024, Metropol Lake Resort, Ohrid**

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The 27<sup>th</sup> Congress of SCTM is a



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Dear Esteemed Colleagues and Participants,

We are pleased to present the Book of Abstracts for the 27<sup>th</sup> Congress of the Society of Chemists and Technologists of Macedonia. Like our previous congresses over the past two decades, this event takes place in the cradle of Slavic literacy—a region with a rich history of intellectual accomplishments. We trust that the heritage, along with the beauty of Lake Ohrid and the city itself, will not only make your stay enjoyable but also serve as an added source of inspiration for your own work.

The SCTM congresses have grown into a prominent platform for regional researchers from all fields of chemistry and chemical engineering. We are honored to welcome plenary and invited speakers not only from Macedonia but also from countries like Czechia, Denmark, Italy, Serbia, Spain, and the United Kingdom. In addition, we are proud to feature a wide range of oral and poster presentations from researchers representing Austria, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Croatia, Germany, Greece, Italy, Kosovo, Montenegro, Poland, Serbia, Slovenia, Spain, Romania, and Russia. With nearly 200 presentations from 550 authors and co-authors, it is especially gratifying to see many attendees returning as regular participants.

We hope this Book of Abstracts serves as both a source of inspiration and a record of the exceptional work presented at the 27<sup>th</sup> SCTM Congress. Let's use this opportunity to celebrate not only our achievements but also our resilience, determination, and steadfast commitment to advancing knowledge. Together, we can overcome challenges and, through our collective efforts, continue to drive innovations that make a positive impact on the world.

We extend our heartfelt gratitude to Prof. Jadranka Blaževska Gilev and Prof. Biljana Angjuševa for once again taking on the challenging task of organizing this year's congress. Their tireless efforts and dedication ensured the event's success. We also wish to thank all the members of the scientific and organizational committees who worked tirelessly behind the scenes, with special recognition to Assoc. Prof. Vojo Jovanov, Marija Prosheva and Despina Kostadinova for their management of the website, Book of Abstracts, and other essential tasks.

Our thanks also go to the reviewers and participants whose contributions have been vital to the success of this Congress. Your commitment to the scientific mission emphasizes the value of collaboration, especially during uncertain times. It is through the exchange of ideas, sharing of knowledge, and building of connections that we strengthen our community and advance our fields. Lastly, we express our sincere gratitude to the sponsors, acknowledged at the end of this book, for their generous support.

Prof. Zoran Zdravkovski, president

Society of Chemists and Technologists of Macedonia



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## OBPC P-36

# Investigating the Methods for Obtaining Extracts from Two Types of Herbal Substances from Elderberry, *Sambucus Nigra* L.

Matea Kuzmanoska, Krume Bogeovski and Viktorija Maksimova\*

*Faculty of Medical Sciences, Goce Delcev University, Štip, N. Macedonia*

*\*viktorija.maksimova@ugd.edu.mk*

Besides the most abundant flavonols (quercetin and apigenin) in the flowers, sambunigrin is mostly represented in the leaves. Some triterpenes, sterols, amino acids (glutamic acid, aspartic acid, and alanine), as well as lectins, have also been reported in the leaves and branches of elderberry, *Sambucus nigra* L<sup>1</sup>.

We investigated two different methods of extraction: Soxhlet extraction (SOX) and Ultrasound-Assisted Extraction (UAE), against the conventional method for obtaining herbal infusions from two types of herbal substances: elderberry flower and elderberry herb (leaf with branches). SOX and UAE were performed with ethanol, while infusions were prepared with water. We noticed an important difference in the extraction yields from different herbal parts. Water is an ideal extraction solvent for elderberry flowers, but it has a very weak potential for extracting bioactive compounds from leaves and barks. Ethanolic Soxhlet extraction, performed as a 4-hour continuous extraction at a temperature of 60-65 °C, was the most potent method for this aim. SOX extract absorbances measured at 550 nm were almost 10 times higher for the herb than for the flowers, with an A = 1.032 and 0.136, respectively.

In conclusion, although elderberry flowers are commonly known for their phyto-therapeutic properties, these preliminary findings suggest that there are different groups of hydrophobic bioactive substances represented in the leaves and barks of elderberry. These parts, traditionally used in the treatment of skin burns or wounds, should be analyzed in detail so their benefits can be fully realized.

**Keywords:** elderberry, extracts, ethanol, water, yield.

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