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19th International Conference on Chemistry and the Environment

Belgrade, Serbia, June 8-12, 2025

Environmental Chemistry for Sustainability

E-Book of Abstracts

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19th International Conference on Chemistry and the Environment - ICCE 2025

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E-book of Abstracts
Published by
Serbian Chemical Society
Karnegijeva 4/III, 11000 Beograd, Srbija
tel./fax: +381 11 3370 467; www.shd.org.rs, E-mail: office@shd.org.rs
For Publisher
Melina Kalagasidis Krušić, president of Serbian Chemical Society

Prepress
Research and Development Centre of Printing Engineering, Belgrade

ISBN **978-86-7132-088-7 (pdf file)**

Dear participants, welcome to Belgrade!

On behalf of the Division of Chemistry and the Environment (DCE) (https://www.euchems.eu/divisions/chemistry-and-the-environment-2/) of the European Association of the Chemical Societies (EuChemS) (https://www.euchems.eu/), the Serbian Chemical Society (https://www.shd.org.rs/en/), and the local organizing committee, it is our great pleasure and privilege to warmly welcome you to the 19th International Conference on Chemistry and the Environment (ICCE 2025).

This prestigious event, which gathers nearly 350 participants from across the globe is hosted by the Serbian Chemical Society with the support of the University of Belgrade and the University of Novi Sad.

At a time when continued scientific progress is essential to ensure a healthy environment and a sustainable future, ICCE 2025 addresses key challenges and emerging developments, advances knowledge and inspires action through the lens of Environmental Chemistry. In addition to the main program running in fourteen parallel sessions, ICCE 2025 will feature four pre-conference satellite events, each dedicated to current research priorities and strategic environmental topics and EuChemS DCE Career Award lecture by Terry Frank Bidleman from Sweden. The scientific program includes seven plenary lectures including two Distinguished Lectures from the American Chemical Society, and fourteen keynote lectures that introduce parallel sessions, comprising 175 oral and 156 poster presentations. A Special Editorial Panel Discussion, with editors from leading international scientific journals, will provide valuable insight into the evolving landscape of scientific publishing.

ICCE 2025 provides an excellent platform for networking, exchange of ideas and collaboration. Our collective mission is to deepen understanding of pollutant's cycling, and their fate and effects in the environment, while advancing pollution prevention and waste management. The latest developments in environmental analysis, pollution monitoring and risk assessment directly impact societal response to environmental challenges, which inevitably focus on various sustainability strategies. To be effective, these responses must be supported by excellent knowledge-based tools and societal inspiration, both offered by ICCE 2025.

We hope that you will not only enjoy the rich scientific program but also take-home memorable experiences from Serbia!

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Acknowledgements

The organizers of ICCE 2025 in Belgrade, Serbia extend their heartfelt gratitude to the many individuals and organizations whose generous support and dedication made this conference possible. We are especially thankful to the Ministry of Education, Science and Technological Development of the Republic of Serbia, our main supporter, for co-financing the event and helping us bring together the international environmental chemistry community. Our sincere appreciation also goes to all other supporters and sponsors who contributed in various ways to the success of ICCE 2025.

Special thanks to the Evertéa Foundation, which generously provided registration grants to a number of students and early-career researchers from around the world who would otherwise not have had the opportunity to attend. Additionally, the best oral and poster presentations will be recognized and awarded by the Local Organizing Committee, with Springer eBook vouchers as prizes.

Roland Kallenborn, EuChemS DCE Chairman, Antonio Marcomini, previous ICCE 2023 Chairman and Philippe Garrigues, Editor-in-Chief of *Environmental Science and Pollution Research* provided us with valuable guidance in shaping the format and structure of this year's conference in line with the ICCE tradition. The input of all EuChemS DCE members was instrumental in refining the scientific program, selecting invited speakers, and ensuring a robust and fair abstract review process. We deeply appreciate the support of our colleagues from partner associations as George Cobb, John Giesy and Virender Kumar Sharma from Division on Environmental Chemistry of the American Chemical Society (ACSenvr), Roberto Terzano, Hemda Garelick and Melanie Kah from International Union of Pure and Applied Chemistry (IUPAC) and Takeshi Nakano from Japan Society for Environmental Chemistry for helping us to make this event remarkable.

Company "Congrexpo" d.o.o., our professional conference organizer, led by Mrs. Olivera Popović, manages all logistics and technical coordination with dedication and professionalism. The Hotel M team, under the direction of Mrs. Jelena Jakovljević, ensures a welcoming and pleasant experience for all participants in the warm and familiar setting of one of Belgrade's most established congress venues. A very special "thank you" goes to our volunteers Slaven Tenodi, Tijana Marijanović, Sanja Vasiljević, Dušan Rakić, Marija Simić, Katarina Stojanović, Marija Kovačević, Ana Lazić, and Lazar Popović.

We thank all the participants for their oral and poster presentations which make the ICCE2025 shining!

Professor Ivana Ivančev-Tumbas,
EuChemS DCE delegate of Serbian Chemical Society

Professor Vladimir Beškoski,
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Original scientific contribution

In vitro evaluation of hemolytic properties of *Raphidiopsis raciborskii* strains: Geographic and toxicological variations

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Raphidiopsis raciborskii (Wołoszyńska) Aguilera & al. 2018 is a freshwater cyanobacterial species widely distributed in aquatic environments. Certain strains of this species have the potential to produce a range of potent toxins, including cylindrospermopsin, anatoxin-a, and saxitoxin. These toxins are known to have harmful effects on humans and other organisms, posing a significant risk to both human health and the surrounding ecosystem [1]. Therefore, the investigation of the toxic effects of *R. raciborskii* metabolites is of great importance, as they can be present in drinking water, recreational waters, or contaminate food intended for both animals and humans. In this study, the hemolytic properties of extracts obtained from *R. raciborskii* cultures isolated from various locations, including Poland (six different locations), Israel, and Australia (two strains producing cylindrospermopsin cyanotoxin), were examined using *in vitro* experiments on human erythrocytes. Cyanobacterial biomass was harvested after five weeks of growth and extracted with 75% methanol. The obtained dry extracts, dissolved in PBS, were tested in three different concentrations on erythrocytes. *Microcystis aeruginosa* PCC 7813, known to produce microcystin, was used as a reference sample. The results of the hemolytic properties of *R. raciborskii* extracts at three different concentrations (75 µg/mL, 150 µg/mL, and 300 µg/mL) showed that strains from Poland exhibited the highest hemolytic activity among examined samples. The hemolysis increased with concentration, with 300 µg/mL consistently causing the highest percentage of hemolysis across all tested strains. Strains from Israel and Australia showed minimal or no hemolytic activity. The reference strain *M. aeruginosa* exhibited negligible hemolysis at all tested concentrations. Although strains from Poland localities are refer as non-toxic, one of them, isolate from Zńinskie Małe locality, caused approximately 45% of homolyses at concentration of 300 µg/mL, In contrast, two *R. raciborskii* strains from Australia with confirmed production of cylindrospermopsin cyanotoxin and *M. aeruginosa*, known to produce microcystin, did not show hemolytic effects. This suggests that the known cyanotoxins are not main compounds involved in the hemolysis. Moreover, the variability in responses across hemolytic tests indicates that each strain may produce a unique set of compounds with distinct effects. These findings highlight the potential ecological and health risks not only associated with known cyanotoxin-producing *R. raciborskii* strains but also with strains producing unidentified hemolytic metabolites, emphasizing the need for further research to identify and assess the impact of undefined and undescribed metabolites.

Acknowledgments

This study was supported by the Serbian Ministry of Education, Science and Technological Development (No. 451-03-136/2025-03/200122). The project is co-financed by the Governments of Czechia, Hungary, Poland and Slovakia through Visegrad Grants from the International Visegrad Fund. The authors gratefully acknowledge the financial support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Grants No. 451-03-137/2025-03/ 200125, 451-03-136/2025-03/ 200125, 451-03-136/2025-03/ 200122). This publication is based upon work from COST Action CYANOACTION (Nr. CA23160) supported by COST (European Cooperation in Science and Technology).

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