

Conference Program

Applied Natural Sciences

2025



17 – 19 September 2025

Štrbské Pleso, Slovakia

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MATEJ BEL
UNIVERSITY

ŮCM
FACULTY
OF NATURAL
SCIENCES

The 9th International Scientific Conference **APPLIED NATURAL SCIENCES 2025**

17th – 19th of September 2025

Štrbské Pleso, Slovakia

INTERNATIONAL SCIENTIFIC CONFERENCE PROGRAM

17 September 2025 / Conference Day 1

11:00 – 19:00 Registration (Foyer)

14:00 – 14:30 *Coffee Break (Foyer)*

Congress Hall

14:30 – 15:00 **Opening & Welcome**

Speech by Prof. Katarína Slobodová Nováková, Rector, *University of Ss. Cyril and Methodius in Trnava*

Speech by Assoc. Prof. Iveta Dirgová Luptáková, Dean, *Faculty of Natural Sciences, University of Ss. Cyril and Methodius in Trnava*

Speech by Assoc. Prof. Marek Drímal, Dean, *Faculty of Natural Sciences, Matej Bel University in Banská Bystrica*

15:00 – 16:30 **Keynote lectures**

Chair: Ildikó Matušíková

15:00 – 15:45 **Svetlana Hrouzková**

Slovak University of Technology in Bratislava

Green Transformation of Analytical Methods in Environmental Pollution Monitoring

15:45 – 16:30 **Marcin Bernas**

University of Bielsko-Biala

Data-Driven Decisions: Selecting the Right Model for Your Data's Nature

16:30 – 17:00 *Coffee Break (Foyer)*

Congress Hall

17:00 – 18:30 Poster Session I

Committee: Dominika Vešelényiová

Ingrid Turisová

Jarmila Škrinárová

Poster number	Name
1	Martina Kešeláková <i>Understanding β-1,3-glucan synthase specificity and evolution in <i>Euglena gracilis</i></i>
2	Pavol Hlubina <i>Utilisation of mycorrhizal fungi in the degradation of microplastics from soil</i>
3	Radmila Valová <i>Biochar and bioaugmentation applied to soil mitigate impacts of combined stress with potentially toxic elements and drought on red fescue</i>
4	Vanessa Gelanová <i>The impact of calcium ions on the expression of transmembrane calpains in unicellular flagellate <i>Euglena gracilis</i></i>
5	Šimon Ján Rezbárik <i>Biosorption of Li⁺ ions from aqueous solutions using modified cyanobacterial biomass</i>
6	Jana Kemenczeiová <i>Application of high-throughput sequencing for the analysis of grapevine virome</i>
7	Alexandra Hlavatá <i>Shaping zinc-rich wheat: The phenotyping frontier in biofortification</i>
8	Juraj Habdák <i>In vitro micropropagation of Country mallow (<i>Sida cordifolia</i> L.)</i>
9	Daniil Vainberg <i>Effects of superabsorbent polymer on the activity of antioxidant enzymes and defensive PR-proteins in agricultural crops grown under drought conditions</i>
10	Jafar Iqbal <i>Exploring the potential of spelt (<i>Triticum spelta</i> L.) wheat lines in Czech Republic: Growth, yield and quality characterization</i>
11	Muhammad Roman <i>Integrated organic and inorganic fertilization effects on silage maize and soil quality across Czech agro-ecological zones</i>
13	Marián Hostovecký <i>Virtual reality as a tool for simulation of land degradation and reclamation scenarios – user experience test and satisfaction</i>
14	Lenka Bobuľská <i>Impact of mercury contamination on soil chemical properties in the historical mining area of Gelnica</i>

Poster number	Name
15	Patrik Boršoš <i>Artificial intelligence in recruitment: ethical, decision-making and security implications of AI-based systems in human resources</i>
16	Richard Hančinský <i>Energetic trade-offs in two wheat cultivars under metal stress in different nitrogen conditions</i>
17	Justyna Bohacz <i>Microbial activity of Cu-mining heap in Central Slovakia before and after application of natural sorbents</i>
18	Michal Čerňanský <i>Code generation with large language models</i>
19	Lenka Demková <i>Soil contamination by mercury in the vicinity of abandoned mines: A case study from Gelnica, Slovakia</i>
20	Miroslav Horník <i>Human stem cells radiolabeling with unconventional positron emitting metals for theranostic applications</i>
21	Darja Gabriška <i>Using artificial intelligence to optimize performance and autonomously manage relational database systems</i>
22	Ján Kraic <i>Plant cell, tissue, and organ cultures: research and application perspectives</i>
23	Martin Valica <i>Sorption separation and solidification of heavy metals from metal mine tailings water using synthetic zeolites and geopolymers</i>
24	Karim Suhail Al Souki <i>Annual and perennial ryegrass effects on soil properties</i>

19:00 – 22:00 *Dinner and wine tasting*

INTERNATIONAL SCIENTIFIC CONFERENCE PROGRAM

18 September 2025 / Conference Day 2

08:30 – 12:00 Registration (Foyer)

Congress Hall

09:00 – 09:50 Keynote lecture

Chair: Josef Trögl

Jacob Lorenzo Morales

Universidad de La Laguna

*Fighting Emerging Diseases in an Outermost Region of EU:
The Case of the Canary Islands*

09:50 – 10:20 Coffee Break (Foyer)

Congress Hall, Coffee Lounge, Hunting Lounge

10:20 – 12:00 Parallel Scientific Sessions – Oral Presentations

Biological and Environmental Sciences

Chemistry and Environmental Sciences

Young Scientists Session

Coffee Lounge

10:20 – 12:00 Biological and Environmental Sciences, oral presentations

Chair: Martin Valica

Time	Name
10:20 – 10:40	Zdenka Kwoczynski
	Biochar from grape pomace: Agronomic and environmental applications
	Zdeňka Kwoczynski, Hana Burdová, Jiří Čmelík, Diana Polanská Nebeská, Josef Trögl, Pavel Leštínský
	Jan Evangelista Purkyně University, Czech Republic

Time	Name
10:40 – 11:00	Peter Pristaš Brine over gold – bioprospecting of halophilic microbiota from Miocene salt deposits <i>Peter Pristaš, Jakub Milčák, Soňa Brestovičová</i> <i>Pavol Jozef Safarik University in Kosice, Slovakia</i>
11:00 – 11:20	Katarína Trnková Tracking pathogenic Amoebae in water: Molecular insights into emerging health risks <i>Katarína Trnková, Emma Nogová</i> <i>Matej Bel University in Banská Bystrica, Slovakia</i>
11:20 – 11:40	Jiří Holátko Organic carbon amendments in livestock feeds reduce rumen methane emissions and improve manure quality and soil carbon stability <i>Jiri Holatko, Jiri Kucerik, Ondrej Malicek, Svetlana Malyugina, Antonin Kintl, Jakub Houska, Julie Sobotkova, Oldrich Latal, Martin Brtnicky</i> <i>Agrovyzkum Rapotin, Ltd., Czech Republic</i>
11:40 – 12:00	Liudmyla Mironets Training of future biology teachers in summer science schools <i>Liudmyla Mironets</i> <i>Sumy State Pedagogical University named after A. S. Makarenko, Ukraine</i>

Horizont Lounge

10:20 – 11:40 Chemistry and Environmental Sciences, oral presentations
 Chair: Peter Nemeček

Time	Name
10:20 – 10:40	Ignác Bugár Technique for single-shot time-resolved spectroscopy of irreversible chemical processes utilizing specialty dual-core optical fibers <i>Sarah Pulikottil Alex, Edgar Kaksis, Ryszard Buczynski, Audrius Pugžlys, Andrius Baltuška, Ignác Bugár</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
10:40 – 11:00	Zuzana Kramplová Electrochemical determination of DMST in water samples <i>Zuzana Kramplová, Andrea Purdešová</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>

Time	Name
11:00 – 11:20	Zita Tokárová (Un)revealed proceeding of Suzuki-Miyaura cross-coupling of thienyl-thiazolo[5,4-d]thiazole halides and sbiobifluorenyl boranes <i>Zita Tokárová, Anita Eckstein, Erika Kozma, Wojciech Mróz</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
11:20 – 11:40	Andrea Purdešová Electrochemical determination of selected biologically active substances <i>Andrea Purdešová, Patrik Beňovič</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>

Congress Hall

10:30 – 12:00 Symposium Young Scientists, oral presentations

Chair: Jana Moravčíková

Committee: Terézia Beck

Marián Hostovecký

Time	Name
10:30 – 10:45	Nicolas Búčik Reproducible testing of query performance in MongoDB, ArangoDB, CosmosDB, and TerminusDB <i>Nicolas Búčik, Marek Šimon, Ladislav Huraj</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
10:45 – 11:00	Ľubomíra Jurečková Production of polyhydroxyalkanoates from molasses by bacteria <i>Cupriavidus necator</i> <i>Ľubomíra Jurečková, Daniela Chmelová, Miroslav Ondrejovič</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
11:00 – 11:15	Dominik Hrinkino Virtual laboratories for network technologies: An analysis of selected tools <i>Dominik Hrinkino, Ladislav Huraj, Marek Šimon</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
11:15 – 11:30	Jason Cuthbert Classification of motor imagery EEG data: Attribution of high-impact electrodes to associated brain regions <i>Jason Cuthbert, Adham Atyabi</i> <i>University Of Colorado Colorado Springs, United States</i>

Time	Name
11:30 – 11:45	Peter Hafner Case study on UI migration in iOS: Adapting a radio streaming application to liquid glass design <i>Peter Hafner, Iveta Dirgová Luptáková, Michal Čerňanský</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
11:45 – 12:00	Silvia Bartóková 7,000 years of environmental change in the Eastern Carpathians: A palynological record from Lake Vinderel <i>Silvia Bartóková, Barbora Kiapěšová, Katarína Trnková</i> <i>Matej Bel University in Banská Bystrica, Slovakia</i>

Hunting Lounge

10:15 – 12:15 CYBES Kick-off Meeting
 Erasmus Small-scale Partnership Project

12:30 – 13:45 Lunch

Congress Hall, Hunting Lounge

14:00 – 16:00 Parallel Scientific Sessions – Oral Presentations
 Young Scientists Session
 Applied Informatics and Computer Sciences

Congress Hall

14:00 – 15:15 Symposium Young Scientists, oral presentations
 Chair: Jana Moravčíková
 Committee: Terézia Beck
 Marián Hostovecký

Time	Name
14:00 – 14:15	Oto Gróf Data analysis to support decision-making processes <i>Oto Gróf, Ladislav Huraj</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>

Time	Name
14:15 – 14:30	Viktória Košíková Modification of solid phase extraction procedure for the determination of 20 selected phenolics in plant material by liquid chromatography <i>Viktória Košíková, Peter Nemeček</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
14:30 – 14:45	Martin Kubovčík Analysis and evaluation of SQL tests using generative artificial intelligence models <i>Martin Kubovčík, Jiří Pospíchal</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
14:45 – 15:00	Michaela Murgašová Determination of microbial isolates from two different composts and the evaluation of their potency to stimulate the growth of tomato <i>Michaela Murgašová, Vladimíra Krempaská, Terézia Beck, Janka Ševčíková, Matej Vesteg</i> <i>Matej Bel University in Banská Bystrica, Slovakia</i>
15:00 – 15:15	Lenka Vavrincová Biochar/eggshell-based mechanochemically activated adsorbents for efficient phosphate recovery <i>Lenka Vavrincová, Lucia Gašparíková, Martin Pipiška, Vladimír Frišták, Matej Baláž, Miroslav Horník</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>

Hunting Lounge

14:00 – 16:00 Symposium Applied Informatics, oral presentations

Chair: Michal Čerňanský

Time	Name
14:00 – 14:20	Jiří Pospíchal Hacking the mind of AI <i>Jiří Pospíchal, Iveta Dirgová Luptáková</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
14:20 – 14:40	Adrián Hamada Experimental verification of the performance of the iEDF scheduling algorithm for IoT tasks in an Edge cloud system <i>Adrián Hamada, Jarmila Škrinárová</i> <i>University of Žilina, Matej Bel University in Banská Bystrica, Slovakia</i>

Time	Name
14:40 – 15:00	Dominik Hrinkino An analysis of SSH attack frequency based on standard vs. non-standard port usage <i>Dominik Hrinkino, Ladislav Huraj, Marek Šimon</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
15:00 – 15:20	Andrej Mihálik Real-time rendering of glittery materials: Photorealistic visualizations for interactive applications <i>Roman Ďurikovič, Róbert Kica, Andrej Mihálik</i> <i>Comenius University, Slovakia</i>
15:20 – 15:40	Peter Střelec Model design for data acquisition from heterogeneous sensors that produce lysimeter station data <i>Peter Střelec, Dominik Bucak</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>
15:40 – 16:00	Marek Šimon Resilience of multi-model NoSQL databases to transport-layer DDoS attacks <i>Nicolas Búčik, Marek Šimon, Ladislav Huraj</i> <i>University of Ss. Cyril and Methodius in Trnava, Slovakia</i>

Coffee Lounge

15:30 – 16:00 Meet the Editor
 Chair: Josef Trögl

16:00 – 16:30 Coffee Break (Foyer)

Congress Hall

16:30 – 18:00 Poster Session II

Poster number	Name
1	Antonín Kintl <i>Efficiency of using digestate in growing intercrops</i>
2	Beata Vranovičová <i>Molecular properties of amino acids in water</i>
3	Tibor Maliar <i>The balance of plant extracts potency to scavenge model radical and to reduce ferric ion in model complex</i>

Poster number	Name
	Tibor Maliar
4	<i>The prediction of DPPH radical scavenging potency and ability to reduce ferric ion in model complex for selected compounds in silico</i>
	Tibor Maliar
5	<i>Swiss similarity – public web tool for searching of new, anti-bacterially effective NitroxolineTM structural analogues</i>
	Alžbeta Michalíková
6	<i>Air pollution data analysis in Prague</i>
	Renata Gašparová
7	<i>The use of selected in silico methods in the investigation of 2,3,5,7-tetrabromobenzofuro[3,2-b]pyrrole as a potential antibacterial drug</i>
	Terézia Beck
8	<i>Bacterial inhabitants of wood-decay fungi basidiocarps</i>
	Miroslav Ŏlvecký
9	<i>An analysis of semantic similarity detection methods for automated assessment of open-ended questions</i>
	Klára Lisková
10	<i>Isolation and characterization of copper-tolerant <i>Arthrobacter</i> sp. from a former gold/copper mine</i>
	Katarína Pribilová
11	<i>The use of artificial intelligence in e-learning systems</i>
	Peter Manko
12	<i>Flying sensors: Honey bees (<i>Apis mellifera</i>) as indicators of trace contamination in the landscape</i>
	Kristína Marková
13	<i>In situ electrically enhanced mobilisation, oxidation and bioremediation of extremely high organic contamination</i>
	Ildikó Matušíková
14	<i>Comparative cadmium tolerance in flax: Screening cultivars for in-situ phytoremediation feasibility</i>
	Vladimír Siládi
15	<i>Cybersecurity by design: Modeling processes first</i>
	Abdul Mannan Rouhani
16	<i>Valorization of <i>Miscanthus × giganteus</i> biomass ash for soil improvement and plant growth support</i>
	Eva Ŭrgeová
17	<i>Comparison of the antibacterial effect of biogenic silver and copper nanoparticles</i>

Poster number	Name
18	Julie Sobotková <i>Biomass of intercrops as a source of lignin as a precursor for the formation of humus substances in the soil</i>
19	Jozef Sokol <i>Biogenic amines in foods and edible products and methods for their determination</i>
20	Jana Moravčíková <i>Plant-mediated green synthesis of silver nanoparticles and their characterization</i>
21	Janka Ševčíková <i>Bokashi composting as an alternative method of processing biodegradable kitchen waste in households</i>
22	Muhammad Zubair <i>Restoring soil health through <i>Lactuca sativa</i> phytoremediation of hospital wastewater contaminated soil</i>
23	Peter Nemeček <i>Development and optimization of a microplate-based assay for phytic acid analysis in cereals</i>
24	Monika Lisinovičová <i>Effect of silicon on pigments in grain amaranth under abiotic stress</i>
25	Jana Jurinová <i>Design of an interactive tool for enhancing algorithmic thinking and programming skills</i>
26	Ľubica Uváčková <i>Salinity-induced changes in photosynthetic pigments and proline levels in <i>Euglena gracilis</i></i>
27	Daniel Mihálik <i>Biocidal effect of lichen extract on selected phytopathogens</i>

19:00 – 22:00 *Dinner and Social evening*



INTERNATIONAL SCIENTIFIC CONFERENCE PROGRAM

19 September 2025 / Conference Day 3

Congress Hall

09:00 – 09:30 Concluding Remarks

09:30 – 11:00 *Check-out*

