The Serbian Society for Ceramic Materials

Institute for Multidisciplinary Research, University of Belgrade

Institute of Physics, University of Belgrade

Center of Excellence for the Synthesis, Processing and Characterization of Materials for use in Extreme Conditions "CEXTREME LAB" - Institute of Nuclear Sciences "Vinča", University of Belgrade

Faculty of Mechanical Engineering, University of Belgrade

Center of Excellence for Green Technologies, Institute for Multidisciplinary Research, University of Belgrade

Faculty of Technology and Metallurgy, University of Belgrade

PROGRAMME AND THE BOOK OF ABSTRACTS

8th Conference of The Serbian Society for Ceramic Materials

June 18-20, 2025
Belgrade, Serbia
8CSCS-2025

Edited by:
Branko Matović
Jelena Maletaškić
Vladimir V. Srdić

SPECIAL THANKS TO

Република Србија
МИНИСТАРСТВО НАУКЕ,
ТЕХНОЛОШКОГ РАЗВОЈА И ИНОВАЦИЈА

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WELCOME MESSAGE

On behalf of the organizers and the organizing committee of the 8th Conference of the Serbian Society for Ceramic Materials (8CSCS-2025), it is my great pleasure to extend a warm welcome to all attendees. We are delighted to host you in Belgrade for this important gathering.

The conference is organized by the Serbian Society for Ceramic Materials, in collaboration with the Institute for Multidisciplinary Research – University of Belgrade, Institute of Physics – University of Belgrade, Center of Excellence for the Synthesis, Processing and Characterization of Materials for Use in Extreme Conditions – "CEXTREME LAB", Institute of Nuclear Sciences "Vinča" – University of Belgrade, Faculty of Mechanical Engineering – University of Belgrade, Center of Excellence for Green Technologies, and the Faculty of Technology and Metallurgy – University of Belgrade.

The primary aim of 8CSCS-2025 is to serve as a platform for academic and professional exchange in the field of ceramic materials. This conference brings together researchers, scholars, and professionals from universities, institutes, and industries across the region and beyond, encouraging the discussion of novel ideas and directions in ceramic materials research.

This year, we are proud to have received 86 abstracts from researchers representing 15 countries, reflecting the growing global interest in ceramic materials. The program features three plenary lectures, 22 invited talks, and 61 oral and poster presentations.

Covered topics include ceramic powders, characterization and processing; computing in materials science; high temperature phenomena, sintering, microstructure design and mechanical properties; ceramic composites, membranes and multimaterials; materials for environmental technology; traditional ceramics and engineering materials; advanced materials for energy-related applications; materials for sensing devices; catalytic materials; electro and magnetic ceramics.

We gratefully acknowledge the support of the Ministry of Education, Science and Technological Development of the Republic of Serbia. Special thanks go to the organizers, session chairs, presenters, exhibitors, and all participants for your contributions and enthusiastic engagement.

We hope that your time in Belgrade will be both professionally rewarding and personally enjoyable. I look forward to meeting you and engaging in fruitful discussions throughout the conference.

Branko Matović
President of the Serbian Society for Ceramic Material

PROGRAMME

PLENARY LECTURES

INVITED LECTURES

ORAL PRESENTATIONS

POSTER PRESENTATIONS

PROGRAMME

Day 1. Wednesday - June 18, 2025.

08.00 – 09.00 Registration

09.00 – 09.15 Opening ceremony and welcome addresses

09.15 – 09.30 Cocktail

Plenary lecture
Chair: Branko Matović, Jelena Maletaškić

09.30-10.00 Plenary lecture, PL-1
Samo B. Hočevar, *MODIFICATION MATERIALS FOR ELECTRO-CHEMICAL SENSORS AND BIOSENSORS*

Session 1: Materials for Sensing Devices
Chairs: Nikola Tasić, Samo B. Hočevar

10.00-10.20 Invited lecture, I-1
Nikola Tasić, *NANOSTRUCTURED MATERIALS FOR ENHANCED ELECTROCHEMICAL BIOSENSING APPLICATIONS*

10.20-10.35 Oral presentation, O-1
Aleksandar Radojković, *THE WATER VAPOR SENSING ABILITY OF RARE-EARTH-DOPED BARIUM CERATE*

Session 2: Materials for Environmental Technology
Chairs: Zorica Branković, Kristijan Vidović

10.35-10.55 Invited lecture, I-2
Ioannis Pashalidis, *LANTHANIDE ADSORPTION BY OXIDIZED BIOCHAR FIBERS*

10.55-11.15 Invited lecture, I-3
Kristijan Vidović, *BISMUTH-BASED ELECTROCHEMICAL APPRO-ACH FOR ENVIRONMENTALLY FRIENDLY DETERMINATION OF SURFACE-ACTIVE SUBSTANCES IN ATMOSPHERIC PARTICLES*

11.15-11.30 Oral presentation, O-2
Sanja Perać, *BIOPOLYMER-BASED ENCAPSULATION OF THUJA PLICATA ESSENTIAL OIL: A POTENTIAL BIOPESTICIDE AGAINST PHYTOPHTHORA PATHOGENS*

11.30-11.45 Oral presentation, O-3

Jovana Ćirković, *PREPARATION OF BIOPOLYMER BASED PESTICIDE AGAINST PHYTOPHTORA PATHOGENS*

11.45-12.00 Oral presentation, O-4

Marija Botić, *ANTHOCYANIN/BIOPOLYMERS-BASED FILMS AS pH SENSORS FOR MONITORING FOOD FRESHNESS*

12.00-12.15 Coffee break

Session 3: Electro and Magnetic Ceramics

Chairs: Slavko Bernik, Goran Branković

12.15-12.35 Invited lecture, I-4

Slavko Bernik, *EXAMINING POSSIBLE ALTERNATIVES IN DOPING THE ZnO-Cr_2O_3-BASED VARISTOR CERAMICS*

12.35-12.55 Invited lecture, I-5

Tomislav Ivek, *COLOSSAL MAGNETORESISTANCE IN OVER-DOPED $La_{1-x}Ca_xMnO_3$ THIN FILMS*

Session 4: Catalytic Materials

Chairs: Matejka Podlogar, Martina Kocijan

12.55-13.15 Invited lecture, I-6

Shotaro Tada, *FRUSTRATED LEWIS PAIR FUNCTIONALIZATION OF PRECURSOR-DERIVED CERAMICS AND ORGANIC-INORGANIC HYBRID MATERIALS FOR SMALL MOLECULE ACTIVATION*

13.15-13.35 Invited lecture, I-7

Matejka Podlogar, *ZnO NANOSTRUCTURES FOR EFFICIENT PHOTOCATALYTIC DEGRADATION OF ORGANIC CONTAMI-NANTS*

13.35-13.55 Invited lecture, I-8

Martina Kocijan, *STRUCTURAL, MORPHOLOGICAL, OPTICAL, AND PHOTOCATALYTIC PROPERTIES OF TiO_2 THIN FILMS DEPOSED BY PLASMA-ENHANCED ATOMIC LAYER DEPOSITION*

13.55-15.00 Lunch break

13.55-15.00 Poster Session 1

Day 2. Thursday - June 19, 2025

Plenary lecture
Chairs: Subramshu S. Bhattacharya, Ioannis Pashalidis

10.00-10.30 Plenary lecture, PL-2
Pavol Šajgalík, *IS SILICON NITRIDE BASED CERAMICS SUITABLE FOR THE DRUG DELIVERY?*

Session 5: Ceramic Powders, Characterization and Processing
Chairs: Pavol Šajgalík, Ondrej Hanzel

10.30-10.50 Invited lecture, I-9
Subramshu S. Bhattacharya, *SYNTHESIS AND STRUCTURE-PROPERTY CORRELATIONS IN HIGH ENTROPY OXIDES*

10.50-11.10 Invited lecture, I-10
Ravi Kumar, ESTIMATION OF SINGLE CRYSTAL ELASTIC CONSTANTS FROM POLYCRYSTALLINE CERAMIC MATERIALS – A CASE STUDY WITH AN ENTROPY STABILIZED TRANSITION METAL OXIDE

11.10-11.25 Oral presentation, O-5
Mayank Mishra, *MULTI-MODAL MECHANICAL CHARACTERIZATION OF ADDITIVELY MANUFACTURED ALUMINA CERAMICS USING MINIATURE TESTING TECHNIQUES*

11.25-11.40 Coffee break

Session 6: High Temperature Phenomena, Sintering, Microstructure Design and Mechanical Properties
Chairs: Peter Tatarko, Ravi Kumar

11.40-12.00 Invited lecture, I-11
Ondrej Hanzel, *EFFECT OF PHASE COMPOSITION AND LATTICE OXYGEN CONTENT ON THERMAL CONDUCTIVITY OF SILICON CARBIDE CERAMICS*

12.00-12.20 Invited lecture, I-12
Peter Tatarko, *NOVEL ULTRA-HIGH TEMPERATURE CERAMICS: PROCESSING AND INTEGRATION*

12.20-12.40 Invited lecture, I-13
Hakan Ünsal, *DEVELOPMENT AND ABLATION BEHAVIOR OF ULTRA-HIGH-TEMPERATURE CERAMIC MATRIX COMPOSITES*

12.40-12.55 Oral presentation, O-6

Miloš Dujović, *STABILITY AND PROPERTIES OF M_2AlC PHASES WITH COMPOSITIONALLY COMPLEX M-LAYERS*

12.55-13.10 Oral presentation, O-7

Asif Ali, *INFLUENCE OF SPARK PLASMA SINTERING ON THE STRUCTURE, MICROSTRUCTURE, AND PROPERTIES OF Nb-DOPED $BATIO_3$ PEROVSKITES*

13.10-14.10 Lunch break

13.10-14.10 Poster Session 2

Session 7: Advanced Materials for Energy-Related Applications

Chairs: Zoltán Lénčéš, M. Balasubramanian

14.10-14.30 Invited lecture, I-14

Zoltán Lénčéš, *SILICON/GRAPHITE ANODE PERFORMANCE IMPROVED BY ATOMIC LAYER DEPOSITED ZnO FILMS AND FLUOROETHYLENE CARBONATE ADDITIVE*

14.30-14.50 Invited lecture, I-15

M. Balasubramanian, *NITROGEN-DOPED Fe_3O_4-Fe_3C@RGO CATHODE FOR HIGH-PERFORMANCE LITHIUM-SULFUR BATTERIES*

14.50-15.10 Invited lecture, I-16

Jelena Vukmirović, *SOLUTION-PROCESSED PEROVSKITE THIN FILMS: FROM COMPLEX ARCHITECTURES TO EPITAXIAL LAYERS*

15.10-15.25 Oral presentation, O-8

Imrongnaro Longkumer, HIGH-ENTROPY PEROVSKITE OXIDES WITH SUBSTITUTIONS ON BOTH A AND B SITES FOR THERMOELECTRIC APPLICATIONS

15.25-15.40 Oral presentation, O-9

Emilija Nidžović, *COMPOSITIONALLY COMPLEX SPINEL-TYPE OXIDES FOR ADVANCED APPLICATIONS*

20.00-01.00 Conference Dinner at AMFORA

Day 3. Friday - June 20, 2025

Plenary lecture
Chairs: Jelena Zagorac, Dejan Zagorac

10.00-10.30 Plenary lecture, PL-3
K.C. Hari Kumar, *THERMODYNAMIC MODELLING OF THE Ta-N-O SYSTEM*

Session 8: Computing in Materials Science
Chairs: K.C. Hari Kumar, Elena Raksha

10.30-10.50 Invited lecture, I-17
Dejan Zagorac, *KOVIN ALGORITHM: BRIDGING THE GAP BETWEEN THEORY AND EXPERIMENT*

10.50-11.10 Invited lecture, I-18
Elena Raksha, *MODEL COMPOUNDS FOR CARBON-BASED SORBENT MATERIALS INVESTIGATION BY EXPERIMENTAL AND COMPUTATIONAL METHODS*

11.10-11.25 Oral presentation, O-10
Inga Zhukova, *COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF NON-EQUIMOLAR HIGH-ENTROPY DIBORIDES: STRUCTURAL, MECHANICAL, AND THERMODYNAMIC INSIGHTS*

11.25-11.40 Oral presentation, O-11
Dušica Jovanović, *ENERGY LANDSCAPE OF NEW HYBRID ORGANIC-INORGANIC PEROVSKITES: GUANIDINIUM-BX_3 SUBSTITUTED BY B = (Be^{2+}, Ba^{2+}, Zn^{2+}, Ge^{2+}, Sn^{2+}) AND X = (I^-, F^-)*

11.40-12.00 Coffee break

Session 9: Ceramic Composites, Membranes and Multimaterials
Chairs: Claus Rebholz, Žaklina Burghard

12.00-12.20 Invited presentation, I-19
Žaklina Burghard, *CERAMIC MICRO-SCROLLS FOR SOFT ROBOTICS: BIOINSPIRED MAGNETIC ACTUATORS*

12.20-12.35 Oral presentation, O-12

Aleksandr Maletskii, *INFLUENCE OF NEUTRON IRRADIATION ON THE AGGREGATE- AND DISPERSION-STRENGTHENED STRUCTURE OF ZTA COMPOSITE CERAMICS*

12.35-12.50 Oral presentation, O-13

Svetlana Butulija, *PROTON-IRRADIATED DOX-LOADED MULTI-WALLED CARBON NANOTUBES: TOWARD SAFER CHEMO-THERAPEUTIC DELIVERY*

12.50-13.05 Oral presentation, O-14

Gianmarco Taveri, *ISOVALENT SUBSTITUTION OF OCTAHEDRAL SITES IN NaSICON COMPOUNDS: HOW ELECTROCHEMICAL PROPERTIES ARE AFFECTED*

Session 10: Tradicional Ceramics and Enigeering Materials

Chairs: Tatjana Volkov-Husović, Zvezdana Baščarević

13.05-13.25 Invited lecture, I-20

Claus Rebholz, *TURNING WASTE INTO VALUE: ECO-FRIENDLY THERMAL INSULATING MORTARS FROM RECYCLED RIGID FOAMS*

13.25-13.45 Invited lecture, I-21

Tatjana Volkov-Husović, *RECYCLING OF REFRACTORY BRICKS USED IN IRON AND STEEL INDUSTRY*

13.45-14.05 Invited lecture, I-22

Zvezdana Baščarević, *DURABILITY OF ALTERNATIVE CEMENTI-TIOUS BINDER*

14.05-14.20 Oral presentation, O-15

Antonis Kyriacou, *ENGINEERING Ni–Al REACTIVE POWDERS: EFFECT OF BALL MILLING TIME AND PARTICLE SIZE ON MATERIAL PROPERTIES*

14.20-15.20 Lunch break

15.20-16.00 Closing Ceremony

POSTER SESSION

Day 1. Wednesday - June 18, 2025

Poster Session 1: Ceramic Powders, Characterization and Processing

P1. Bojana Simović, *TEXTILE DYES REMOVAL USING HYDROTHERMALLY SYNTHESIZED $LiTiO_2$*

P2. Milena Rosić, *SYNTHESIS AND CHARACTERIZATION OF $Co_{0.9}Gd_{0.1}MoO_4$ NANOPOWDERS*

P3. Tijana B. Vlašković, *FACILE SYNTHESIS AND CHARACTERIZATION OF PEROVSKITE-TYPE OXIDE $Ca_{0.9}Er_{0.1}MnO_3$*

P4. Natalija Milojković, *DESIGN OF Bi_2O_3 PROPERTIES BY BIOPOLYMER*

P5. Neda Nišić, *NOVEL MULTIDOPED SOLID IONIC CONDUCTOR BASED ON CeO_2 FOR APPLICATION AS ELECTROLYTE IN IT-SOFC DEVICES*

P6. Tamara Matic, *ION-DOPED MESOPOROUS BIOACTIVE GLASS PARTICLES AS CIPROFLOXACIN DRUG DELIVERY VEHICLES*

P7. Marija Prekajski Đorđević, *NOVEL Ca-Sr-Ba HYDROXYAPATITE: FROM NANOEMULSION TO DENSE BIOCERAMIC*

P8. Tina Radošević, *APPLICATION OF FIB-SEM CHARACTERIZATION IN THE DEVELOPMENT OF PHOTOCATALYTIC MATERIALS FOR ENVIRONMENTAL REMEDIATION*

Poster Session 2: High Temperature Phenomena, Sintering, Microstructure Design and Mechanical Properties

P9. Jelena Mitrović, *THE COLD SINTERED $BaSn_{1-X}In_XO_3$ (X = 0.00, 0.05, 0.10, 0.15 AND 0.20) SAMPLES AND THEIR FUNCTIONAL PROPERTIES*

P10. Olivera Zemljak, *OPTIMIZING COLD SINTERING CONDITIONS FOR DENSE YTTRIUM MANGANITE CERAMICS*

P11. Vladimir Pavkov, *EFFECT OF SINTERING TEMPERATURE ON THE COLOUR VARIATION OF ANDESITE BASALT CERAMICS*

Poster Session 3: Advanced Materials for Energy-Related Applications

P12. Jovana Ackovic, *A CHRONOPOTENTIOMETRIC EXAMINATION OF CO-DOPED HETEROPOLY ACID AND ITS BRONZE*

P13. Jelena Bobić, *POLYCRYSTALLINE AND EPITAXIAL THIN FILMS OF $La_{1-X}Na_XMnO_3$*

Poster Session 4: Computing in Materials Science

P14. Tamara Škundrić, *UNVEILING THE ENERGY LANDSCAPE OF $Cr_3Si_3N_8$ THROUGH A MULTI-METHODOLOGICAL APPROACH*

P15. Milan Pejić, *MODELING OF MULTICOMPONENT RARE EARTH COMPOUNDS: ENERGY LANDSCAPE EXPLORATION, STRUCTURE PREDICTION, AND ELECTRONIC PROPERTIES CALCULATION*

P16. Tamara Škundrić, *EXPLORING THE STRUCTURAL DIVERSITY AND ENERGY LANDSCAPE OF $CrSi_2N_4$*

P17. Jelena Zagorac, *THEORETICAL INSIGHT INTO STRUCTURAL AND MECHANICAL FEATURES OF $Hf_{0.5}Ta_{0.5}C$*

P18. Dušica Jovanović, *ENERGY LANDSCAPE OF GLUTAMINE (L) ON Au / Ag / Cu DOPED TiO_2 SURFACES AND POTENTIAL BIOMEDICAL APPLICATIONS*

P19. Maria Čebela, *SILVER-DOPED BISMUTH FERRITE: ENHANCED MAGNETIZATION AND THEORETICAL PREDICTIONS OF NOVEL PEROVSKITE PHASES*

P20. Iva Toković, *DENSITY FUNCTIONAL THEORY STUDY OF LANTHANUM STRONTIUM MANGANITE*

Poster Session 5: Materials for Environmental Technology

P21. Tamara Minović Arsić, *SYNTHESIS AND CHARACTERIZATION OF CARBON CRYOGEL/MULTI-WALLED CARBON NANO TUBES COMPOSITE*

P22. Sanja Petrović, *ADSORPTION OF As^{3+} CATION IN A BATCH SYSTEM BY BENTONITE AT pH 3.5 IN SHORT TIME INTERVALS*

P23. Jelena Jovanović, *DEVELOPMENT OF A BIOPOLYMER-BASED BIO-PESTICIDE WITH AILANTHUS ALTISSIMA EXTRACT FOR SUSTAINABLE CONTROL OF LYMANTRIA DISPAR IN FOREST ECOSYSTEMS*

P24. Kyriacos Ioannou, *FUNCTIONALIZED ACTIVATED CARBON SPHERES FOR ENHANCED WATER DECONTAMINATION*

P25. Andrijana Vasić, *WASTE SLAG FROM LIGNITE COMBUSTION AS AN ADSORBENT FOR THE REMOVAL OF ETHYL XANTHATE FROM WASTEWATER OF THE FLOTATION PLANT FOR COPPER ORE AND PRECIOUS METALS PROCESSING IN BOR*

P26. Radmila Lišanin, *SHUNGITE AS AN ENVIRONMENTALLY RELEVANT MATERIAL AND ITS STABILITY UNDER pH VARIATIONS*

P27. Miodrag Ristović, *INDUSTRIAL WASTE AS A RESOURCE IN ASPHALT PRODUCTION AND ROAD ENGINEERING*

P28. Katarina Stefanović, *UNDERSTANDING THE IMPACT OF TECTONICS ON THE FORMATION OF ZLATOKOP ZEOLITE AS AN ECOLOGICAL RAW MATERIAL*

P29. Irina Kandić, *ACTIVATED CARBON FROM BLACK ALDER CONE-LIKE FLOWERS FOR MICROCYSTIN-LR REMOVAL*

Day 2. Thursday - June 19, 2025

Poster Session 6: Catalytic Materials

P30. Miroslav Hnatko, *ELECTROCHEMICAL SYNTHESIS OF NANOTUBULAR TiO_2 ON Ti-6Al-4V IN DEEP EUTECTIC SOLVENT: FLUORIDE-FREE AND FLUORIDE-ASSISTED APPROACHES*

P31. Stefan T. Jelić, *PHOTOCATALYTIC PERFORMANCE OF RARE EARTH-DOPED $BiVO_4$*

Poster Session 7: Materials for Sensing Devices

P32. Jelena Milićević, *ELECTROCATALYTIC PERFORMANCE AND STRUCTURAL FEATURES OF A Pd-DECORATED MULTIPHASE COMPOSITE ELECTRODE*

P33. Slavica Savić Ružić, *ELECTROSPUN SnO_2 NANOFIBERS FOR ADVANCED GAS SENSING: FROM MORPHOLOGICAL DESIGN TO FUNCTIONAL PERFORMANCE*

P34. Katarina Vojisavljević, *FLEXIBLE AND BIODEGRADABLE PRESSURE SENSORS BASED ON CHITOSAN-GLYCINE REINFORCED WITH MXENE*

P35. Milica Počuča-Nešić, *PIEZOELECTRIC NANO-BIOCOMPOSITES BASED ON CHITOSAN, GLYCINE, AND ZINC OXIDE NANOPARTICLES*

P36. Zorica Marinković Stanojević, *SYNTHESIS OF SnO_2 NANOFIBERS BY ELECTROSPINNING METHOD AND STUDY OF ITS ETHANOL AND ACETONE SENSING PROPERTIES*

Poster Session 8: Ceramic Composites, Membranes and Multimaterials

P37. Polina Kobchikova, *STUDY OF MASS TRANSFER MECHANISMS AT THE INITIAL STAGE OF SINTERING AND THEIR INFLUENCE ON THE STRUCTURE OF ALUMINA-ZIRCONIA COMPOSITE CERAMICS*

P38. Michal Hičák, *HIGHLY POROUS SILICON NITRIDE–BASED COMPOSITE AS DRUG DELIVERY CARRIER?*

Poster Session 9: Electro and Magnetic Ceramics

P39. Danijela Luković Golić, *INDUCED MODIFICATIONS IN STRUCTURAL, MICROSTRUCTURAL, AND FERROELECTRIC PROPERTIES OF BISMUTH FERRITE CERAMICS DOPED WITH LANTHANUM AND EUROPIUM*

Poster Session 10: Tradicional Ceramics and Engineering Materials

P40. Gordana Stanojević, *ASSESSMENT OF ALKALI ACTIVATED BINDERS BASED ON FLY ASH FOR IMMOBILIZATION OF CESIUM*

P41. Bratislav Todorović, *COMPARISON OF FTIR SPECTRA OF BENTONITE CLAY WITH SPECTRA OF ITS BASIC ACTIVATION BY ULTRASOUND*

P42. Svetlana Ilić, *INFLUENCE OF THE PRISMATIC GRAINS ON NANO-INDENTATION BEHAVIOUR OF IRON-DOPED MULLITE*

P43. Aleksandra Šaponjić, *MULLITE BASED CERAMICS OBTAINED FROM WASTE CLAY-DIATOMITE*

P44. Zvezdana Baščarević, *POSSIBILITY TO USE LOCAL PONDED ASH AS SUPPLEMENTARY CEMENTITIOUS MATERIAL*

P45. Branko Matović, COMPOSITION UNIVERSE OF CERAMIC MATERIALS: THE POTENTIAL FOR DISCOVERING NEW FUNCTIONAL CERAMICS THROUGH HIGH-THROUGHPUT ANALYSIS

P46. Aleksa Luković, EFFECTS OF CHEMICAL CORROSION ON BASALT BASED GLASS-CERAMIC COMPOSITES

O-2

BIOPOLYMER-BASED ENCAPSULATION OF *THUJA PLICATA* ESSENTIAL OIL: A POTENTIAL BIOPESTICIDE AGAINST *PHYTOPHTHORA* PATHOGENS

Sanja Perać[1], Aleksandar M. Radojković[1,2], Jovana Cirković[1], Jelena Jovanović[1,2], Zorica M. Branković[1,2], Ivan Milenković[3,4], Slobodan D. Milanović[3,4], Jovan N. Dobrosavljević[3], Vanja M. Tadić[5], Ana R. Zugić[5], Goran Branković[1,2]

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Forests are crucial national resources requiring long-term management. *Phytophthora* species, primarily attacking roots, pose a serious threat to forests, crops, and many plant species. Known as "plant destroyers", these pathogens continue to spread despite preventive measures like proper drainage, hygiene, and chemical treatments. A promising solution is the development of eco-friendly biopesticides derived from plant-based products, such as essential oils (EOs).

This study aimed to develop a new formulation that gradually releases the active components in the essential oils (EOs) from a biodegradable polymer matrix over time. The effects of three EOs from Cupressaceae family - *Chamaecyparis lawsoniana* (A. Murr.) Parl., *Thuja plicata* Donn ex D.Don and *Juniperus communis* L. - were tested against *Phytophthora* species: *P. plurivora*, *P. quercina*, and *P. ×cambivora*. The EOs were encapsulated in a biopolymer matrix containing chitosan and gelatin to form a stable water-in-oil emulsion, ensuring slow release and protection of active components for several weeks. Among the EOs, *Thuja plicata* exhibited the most effective growth inhibition of *Phytophthora* species, with concentrations of 0.1% and 0.5% (v/v) almost completely halting fungal growth over seven days. These results demonstrated the potential of *T. plicata* EO encapsulated in a sustainable biopolymer as an effective biopesticide for natural ecosystem protection.