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XIII CONGRESS OF MICROBIOLOGISTS OF SERBIA
with international participation

MIKROMED REGIO 5

**FROM BIOTECHNOLOGY TO HUMAN
AND PLANETARY HEALTH**



BOOK OF ABSTRACTS

ORGANIZER:



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MINISTRY OF SCIENCE,
TECHNOLOGICAL DEVELOPMENT AND INNOVATION

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Message from the organizing committee

Dear colleagues and friends,

The objective of the event was to present the latest developments in microbiology that contributed to a better understanding of the role of microorganisms in nature and to bring together microbiologists from Serbia and the region with professionals from all over Europe, including microbiologists of various disciplines, bioinformaticians, geneticists, molecular biologists, biochemists, epidemiologists, pediatricians, infectious disease physicians, and all other scientists with common interests.

This regional meeting addressed all prevailing microbiological issues and offered solutions to overcome them by world-class experts in the field. The resistance of microorganisms to antimicrobial drugs is causing major problems in veterinary and human medicine, necessitating the improvement of vaccines and the discovery of new drugs, but also alternative treatment models. Growing antimicrobial resistance, especially biofilm-related, requires alternative measures to biocontrol the spread of the microorganisms in various environments. These sessions discussed possible alternatives to common antimicrobials, ranging from bacteriophage applications, new natural compounds biotechnology or nanotechnology, as well as biological control for the inactivation of pathogenic and/or resistant phenotypes of microorganisms.

In addition, food manufacturers and retailers have been trying for decades to reduce the material damage and risks to human health posed by biofilms in food processing facilities. The environment is already too polluted by many human missteps, so any help from microorganisms to remove or process waste materials can be a big help. We are getting better and better at using microorganisms in technological processes, firstly in the medical field, but also in agriculture, industry and the energy sectors.

Our knowledge of how microbial diversity is distributed in natural environments and how microbes influence ecosystems is constantly evolving as public databases are established and new techniques based on massive sequencing are developed. The microbiomes found in anthropogenic environments and on human-made materials are generally much less complex than those found in natural environments. Despite this simplicity, it is very difficult to link cause and effect when it comes to determining the role of individual microorganisms. Improved genome engineering tools in model organisms allow for a comprehensive remodeling of metabolic and regulatory networks.

At the same time, a growing number of non-model organisms can be modified with different traits so that they can be further used in different applications and environments. This expanded range of engineering capabilities and modified species brings their application in the real world closer and has the potential to make a real contribution to sustainability and addressing global health challenges.

Microorganisms are the key drivers of ecosystem functions, and microbial diversity plays a central role in maintaining the stability and sustainability of ecosystems. These sessions were examined some of the principles that shape and maintain this biodiversity and explore the factors that shape microbiomes and contribute to the success of specific members of communities in different habitats.



Presentations were focused on omics techniques such as metagenomics, metatranscriptomics, proteomics and metabolomics, which are used to better understand why the health of humans, animals and plants depends on microbial interactions. In this way, the complex microbiomes and the interactions between the microbiota and a variety of host organisms from different domains of life were explored.

We strongly believe that the Congress was an excellent place to exchange and combine scientific ideas among experts and participants, with great opportunities to start new international collaborations and joint scientific projects. We have received an overwhelming response to our call, with numerous talented applicants, more than 350 participants from more than 20 countries (Austria, Belgium, Bosnia and Herzegovina, Croatia, France, Georgia, Germany, Greece, Hungary, India, Iraq, Italy, Montenegro, Namibia, North Macedonia, Portugal, Russian Federation, Serbia, Slovenia, Netherlands and United States) applying for the limited number of available grant awards (we have accepted 29 participants). In addition to presentations by invited speakers, the programme also included poster presentations by young researchers and PhD students. We were honoured to welcome 62 lecturers, 15 offered talks and 8 panelists and presenting cases. We have organized oral presentations in 15 parallel sessions, complemented by two panel discussions and a workshop entitled "NGS in Microbiology". We would like to thank all participants for their scientific commitment, especially for the more than 170 abstracts submitted, which contributed significantly to the success of the Congress. The Congress is accredited by the Health Council of the Republic of Serbia under the registration number A-1-185/24.

We hope you enjoyed the Congress programme and found it stimulating and informative. We also hope that you enjoyed the beauty of Belgrade and the Serbian hospitality. We sincerely wish you health, love and happiness and look forward to the new meetings.

Sincerely,



Ivica Dimkić
University of Belgrade
Faculty of Biology, Serbia

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Committee
Chairperson



Dušan Kekić
University of Belgrade
Faculty of Medicine, Serbia

Organizing
Committee
Chairperson



Lazar Ranin
President of the Serbian Society
for Microbiology
Chairperson

Scientific & Organizing
Committee
Co-Chairperson

General information

CONGRESS VENUE

The meeting was held at the Hall „Donji Dorćol“ and Hall „SCHONDA 4“, Mona PLAZA hotel, located at Cara Uroša 62-64, Belgrade, Serbia; Hall „Beogradska panorama“ and Hall „Club“, situated Hotel Palace, Topličin Venac 23, Belgrade, Serbia and Institute of Molecular Genetics and Genetic Engineering, Vojvode Stepe 444a, Belgrade, Serbia.

REGISTRATION OF PARTICIPANTS

Registration desk was open on Thursday, April 4 from 08:00 in front of Hall „Donji Dorćol“, Mona PLAZA hotel, as well as on Friday, April 5 and Saturday, April 6 at the same place. Daily updates on the workshop sessions and social events were available at the registration desk and through the specially designed application for this Congress (<https://play.google.com/store/apps/details?id=com.Mikrobiolozi>). All participants and accompanying persons were kindly requested to wear their accreditation badges during the scientific sessions and workshop social events.

LANGUAGE

The official language of the congress was English.

SOCIAL EVENTS

A group photo was taken in front of Mona PLAZA hotel on Thursday, April 4th, at 11:50. The poster viewing session took place at Hall ‘Club’ of Hotel Palace, ground floor, located at Topličin Venac 23, Belgrade, on Friday from 17:45 to 19:15.”

INFORMATION FOR PRESENTERS

Oral presentations were held at the Hall “Donji Dorćol” and Hall “SCHONDA 4” , First floor of the hotel Mona PLAZA, Cara Uroša 62-64, Belgrade, from April 4th to 6th.



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04th - 06th April 2024

MONA PLAZA Hotel, Belgrade

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CONGRESS



PROGRAMME

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GR53

CRYOPRESERVATION-BASED STRATEGY FOR PPV ERADICATION IN AUTOCHTHONOUS PLUMS: INSIGHTS FROM FRUIT RESEARCH INSTITUTE ČAČAK

Bojana Vasilijević¹, Tatjana Vujović¹, Tatjana Anđelić¹, Vera Katanić¹ and Darko Jevremović¹

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The importance of conserving plant species, particularly those crucial for agriculture, has surged to ensure sustainable utilization of biological resources and prevent further loss of plant diversity. Cryopreservation, the most advanced method for plant conservation, offers promise in this regard. It can be employed for conservation *per se*, or as a potential tool (cryotherapy) for pathogens elimination from infected plants, particularly viruses that threaten agricultural productivity. In the recent study, two vitrification-based cryopreservation methods, D and V cryo-plate, were evaluated for their efficacy in eradicating plum pox virus (PPV) from autochthonous plum cultivars 'Crvena Ranka' and 'Belošljiva', widely present in the Balkan region. A total of 111 pool samples of *in vitro* shoots of plums 'Belošljiva' and 'Crvena Ranka' were tested (65 and 46 samples, respectively). Each sample consisted of an average of 10 plants, in total about 1100 plants. Health status of *in vitro* shoots originated from both control (non-frozen explants) and cryopre-

served explants of infected plums were continuously tested during multiplication for the PPV presence with conventional reverse transcription polymerase chain reaction (RT-PCR). To evaluate these results and obtain the highest efficiency of detection, all samples were further tested using Real-time PCR (qPCR). Using RT-PCR, the PPV was detected in 67 out of 111 tested samples: in 39 samples of plum 'Belošljiva' and 28 of plum 'Crvena Ranka'. Using a qPCR assay, PPV was confirmed in 82 tested samples. Effective PPV elimination from 'Crvena Ranka' was achieved through three cryo-treatments, while neither method (D and V-cryoplate) nor the applied treatments led to PPV elimination in 'Belošljiva'. The qPCR assay demonstrated higher sensitivity compared to conventional RT-PCR, highlighting its potential utility in such assessments. Our findings supported the exceptional specificity and sensitivity of the qPCR technique in detecting PPV in *in vitro* shoots of the plums 'Belošljiva' and 'Crvena Ranka' post-cryotherapy.

KEYWORDS: autochthonous plums; plum pox virus; cryotherapy; qPCR; efficiency

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