ICGEB Meeting and Courses 2023

ICGEB WORKSHOP

TRENDS IN MICROBIAL SOLUTIONS FOR SUSTAINABLE AGRICULTURE

13 – 15 September 2023. Belgrade, SERBIA

BOOK OF ABSTRACTS

ICGEB WORKSHOP

Trends in microbial solutions for sustainable agriculture

13 – 15 September 2023. Belgrade, Serbia

Edition

Collection of the Faculty of Biology

ISSN 3009-3740 (Online)

Publisher

University of Belgrade, Faculty of Biology
Studentski Trg 16, 11158 Belgrade, Serbia
www.bio.bg.ac.rs

For publisher

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Dean of the Faculty of Biology

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Technical Editor & Cover design

Vojislav Simić

Internation Standard Book Number

ISBN 978-86-7078-178-8

ICGEB Workshop

Trends in microbial solutions for sustainable agriculture

13 – 15 September 2023. Belgrade, SERBIA

ORGANIZED AND HOSTED BY

University of Belgrade,
Faculty of Biology, Serbia

International Centre for Genetic Engineering
and Biotechnology (ICGEB), Italy

FERTICO,
Serbia

SUPPORTED BY

Federation of European Microbiological Societies

Federation of European
Microbiological Societies (FEMS)

Serbian Society
of Microbiology

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Министарство просвете,
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PPP2

Novel research project – BioPhysFun for advancement of characterization of *Trichoderma* as biological control agent

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The use of chemical fungicides is detrimental for soil and aquatic ecosystems. Although highly effective, they raise concerns about impact on the environment. Therefore, the need to reduce the use of chemical fungicides and protect the soil and water, pose the challenge to find novel, eco-friendly, but also more efficient, means of crop protection from phytopathogenic fungi. We are aiming to utilize the native *Trichoderma* species, as biological control agent, for controlling or eliminating the phytopathogenic fungi. Our research will be based on cell nano-surgery of fungal cell wall using ultrashort laser pulses and subsequent patch clamping on the released protoplast membrane. This will enable the studies of activity and potency of specific class of antimicrobial short peptides, peptaibols, released by *Trichoderma* species, which act by forming ion channels in pathogen membrane as one of the main mechanisms of their fungicide action. The result of this project will be the developed instrumentation and unique method based on nano-surgery and patch clamp for studies of ionic channels in native fungal plasma membrane. Testing a range of autochthonous *Trichoderma* sp. isolates will enable formulation of their combinations that work best. The selected Trichoderma strains with the highest standardized peptaibol activity in specific combination of conditions, can be used as a starting point for development of new, more potent biocontrol agents.

Keywords: *Trichoderma*; biological control agents; peptaibols; cell nano-surgery; patch clamp.

Acknowledgement: This work was supported by Science Fund of the Republic of Serbia, Green Program of Cooperation between Science and Industry, through the project BioPhysFUN, Research grant No. 4545.