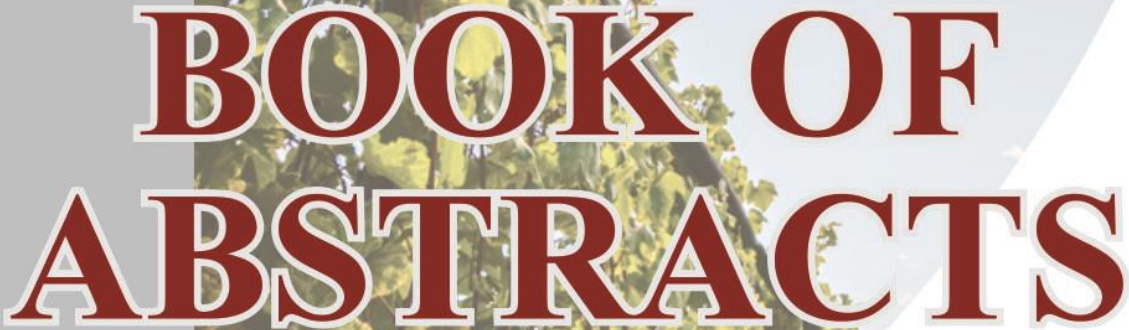




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2021



**BOOK OF
ABSTRACTS**

*XII International Scientific
Agriculture Symposium
"AGROSYM 2021"
October 7-10, 2021*



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PREFACE

Dear colleagues,

In your hands is the Book of Abstracts of the 12th International Scientific Agricultural Symposium "AGROSYM 2021", which I hope you will find useful in your work. As many as 700 contributions have been accepted for the Book of Abstracts. The themes of AGROSYM 2021 cover all branches of agriculture and are divided into seven sessions: 1) Plant production, 2) Plant protection and food safety, 3) Organic agriculture, 4) Environmental protection and natural resources management, 5) Animal husbandry, 6) Rural development and agro-economy, and 7) Forestry and agroforestry.

The multi-functionality of agriculture (viz. crop production, animal production and fisheries) and the central role it plays in food production, food security, rural development, bio-economy (e.g. production of fibres and raw materials for industries) and green economy (e.g. production of biofuels) determine its importance in all countries; especially nowadays, with the second year of the COVID-19 pandemic.

Many scholars and practitioners argue that technology will increase production and feed more people while reducing the variability as well as the environmental impacts of agricultural production. Technology has been particularly important for improving production in non-tree crops such as maize, rice, soybean, wheat and cotton. Because trees have longer cycles, they take longer to improve through traditional breeding programs. New techniques of plant breeding can improve productivity further, but there is a lively academic debate about their pros and cons.

While the focus has been in the past on the production side (cf. productivity, efficiency), more and more attention is nowadays paid to the consumption side as well as the intermediate stages (e.g. processing, distribution) of the food chain thus moving towards a 'farm to fork' approach. Globally, consumers are sending clearer signals than ever before about what they want on their tables i.e. higher quality as well as healthier, safer, and tastier products. Therefore, most companies in the food industry are currently exploring different ways to ensure that they have more control over the production processes for agricultural commodities as well as final products quality. Changes in investment strategy also have the potential to reduce the environmental and social costs of agriculture. It is now apparent to most investors that companies that pay more attention to sustainability and social responsibility, even with the same financial rating, will have better returns both in the short term and over time.

Agri-food systems have been central in the global debate on sustainable development and the achievement of the Sustainable Development Goals (SDGs) as shown by the recent United Nations' Food Systems Summit held in September 2021 in New York. Indeed, agri-food systems are at the center of various global challenges such as climate change, poverty, vulnerability, food insecurity, biodiversity loss, resource scarcity and ecosystem degradation. In this context, one of the goals of the sustainable agriculture movement is to create farming systems that mitigate or eliminate environmental harms associated with industrial agriculture.

Many thanks to all the authors, reviewers and colleagues for their help in editing the Book of Abstracts. Special thanks go to all co-organizers and partners for their unselfish collaboration and comprehensive support.

East Sarajevo, 07 October 2021

Prof. Dušan Kovačević, PhD

Editor in Chief, President of the Scientific Committee of AGROSYM 2021



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AZOTOBACTER, PSEUDOMONAS AND BACILLUS ISOLATES STIMULATE THE GERMINATION AND SEEDLING GROWTH OF MELLISA OFFICINALIS

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Abstract

The objective of this study was the isolation and characterization of *Azotobacter*, *Pseudomonas* and *Bacillus* species from the rhizospheric soil of *Mellisa officinalis* and to examine the effect of isolates application on the seed germination and seedling growth. Isolation, physiological, biochemical, and plant-growth-promoting activity characterization of isolates were done. Monitoring the effects of isolates application on seed germination and seedling growth were evaluated in controlled conditions. The number of germinated seeds, the shoot and root length of seedlings, vigour index and biochemical stress markers (lipid peroxidation intensity and total phenols) were measured. From the rhizosphere of plant 2 *Azotobacter* (denoted as A5 and A6), 5 *Pseudomonas* (denoted as P27, P28, P29, P55 and P56) and 6 *Bacillus* (denoted as B64, B65, B66, B67, B68 and B69) bacteria were isolated. *Azotobacter* isolates showed the ability to live in the condition of low (5) and high (9) pH. The isolates varied in terms of the utilization of carbon sources. Both isolates produced pectinase, hydrogen cyanide (HCN) and utilized organic and inorganic phosphorus. *Pseudomonas* isolates had optimal growth at 10 °C and 37 °C, and on medium with pH 5 and 9. All *Pseudomonas* isolates could produce pectinase, lipase, amylose, IAA, siderophores and HCN. All *Bacillus* isolates could grow on a medium containing 7% NaCl. Two isolates (B65 and B67) showed intensive growth on medium with pH 9. Only two isolates (B64 and B67) produced IAA, and all of them siderophores and HCN. *Bacillus* isolates (B64 and B67) increased, while other isolates reduced stress which was observed by lowering the amount of stress molecules in seedlings. The best effect on the seed germination had *Pseudomonas* (P28) and *Bacillus* (B65, B66) isolates. *Azotobacter* isolates had the greatest stimulatory effect on seedling growth.

Key words: medicinal plants, plant-growth-promoting microorganisms, seedling, total phenols.