

# **Crop Science and Technology: Shaping the Future of Agriculture**

***International Scientific Conference***



***BOOK OF ABSTRACTS***

*September 29 - October 2, 2025 - Belgrade, Serbia*

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Maize Research Institute Zemun Polje

## **Book of abstracts**

CROP SCIENCE AND TECHNOLOGY: SHAPING THE FUTURE OF AGRICULTURE

## **Editors**

Snežana Mladenović Drinić, Jelena Vukadinović, Beka Sarić

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**Status of the dietary fibre and phenolic compounds in some standard and ancient cereals**

*Vesna Dragičević* \_\_\_\_\_ 103

**Soybean hulls as a sustainable source of bioactive compounds: Unlocking functional and health-promoting potential**

*Nevena Barać* \_\_\_\_\_ 104

**Influence of genotype and environment on the fatty acid profile and  $\alpha$ -tocopherol content in safflower (*Carthamus tinctorius* L.) oil**

*Nada Grahovac* \_\_\_\_\_ 105

**Sustainable trends in maize cultivation: organic cropping system for improved bioactive profile of added-value ZP hybrids**

*Marijana Simić* \_\_\_\_\_ 106

**Biscuit quality under acrylamide-targeted agronomy: A bilateral assessment**

*Kristína Kukurova* \_\_\_\_\_ 107

**Free asparagine and sugars in various maize genotypes as principal precursors of acrylamide formation in food**

*Beka Sarić* \_\_\_\_\_ 108

**Blue maize as source of anthocyanins with diverse pharmacological activities: Microencapsulation and fate during accelerated aging and in vitro gastrointestinal digestion**

*Sladana Žilić* \_\_\_\_\_ 109

**Filter strip as a method for detection of antioxidative components in complex matrix: A case study in maize root apoplast**

*Jelena Dragišić Maksimović* \_\_\_\_\_ 110

**Antioxidant capacity and bioactive compounds of maize silk from different ZP genotypes for application in health-promoting dietary supplements**

*Danka Milovanović* \_\_\_\_\_ 111

**Chemical composition of tobacco seed (*Nicotiana tabacum* L.)**

*Gordana Kulić* \_\_\_\_\_ 112

## Blue maize as source of anthocyanins with diverse pharmacological activities: Microencapsulation and fate during accelerated aging and in vitro gastrointestinal digestion

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Among other plant species, cereal grains can also be a source of anthocyanins (ACNs). Whole-grain flour of colored maize has primarily found application in the production of bakery and confectionery foodstuffs. However, application of ACNs originating from maize grains in pharmacy requires their isolation and represent a certain challenge. The aim of the research was to develop microencapsulation systems of ACNs from waste product of blue maize processing using maltodextrin (MD) and hydroxypropyl- $\beta$ -cyclodextrin (HPCD). Liquid blue maize extract was spray dried with and without adding carrier agents: MD (30%), HPCD (30%) and combination of both carriers (15% MD and 15% HPCD). The obtained samples were analyzed for the content of ACNs before and after accelerated aging, as well as for the fate of ACNs in the digestive system. Total ACNs content in the spray dried maize extract (SME) was 12846 mg CGE/kg, with acylated Cy-3-(6'-Mal-Glu) than Cy-3-Glu as dominant. Microencapsulates had a lower content of total anthocyanins by 16, 14 and 26% compared to SME, respectively. Cavity and hollow molecular shape of the CDs make them ideal carrier to decrease phenolic compounds loss. So, after aging, the content of total ACNs detected by HPLC was 11% lower in microencapsulates with MD, compared to that before aging, while in microencapsulates with HPCD the difference was not statistically significant. Due to the action of digestive enzymes, in the first and last stage of digestion of SME and microencapsulates with MD, HPCD and MD+HPCD, the content of ACNs in the fluids was 59, 66, 67 and 64% i.e. 49, 42, 57 and 56%, respectively, of their initial value. Waste product of blue maize processing in form of microencapsulates can contribute significantly to the daily intake of ACNs, especially acylated forms whose daily intake has been estimated at 23% compared to 77% of non-acylated ones.

**Keywords:** blue maize; processing waste; anthocyanins; microencapsulation; fate during aging and digestion

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