

V. INTERNATIONAL ENZYME & BIOPROCESS DAYS

27-29 August 2024

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İzmir, Türkiye

ABSTRACT BOOK



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Corn agro-waste valorization: A dual approach towards cellulase production and increased polyphenol extraction

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Recently, the exploration of agricultural by-products for biotechnological applications has gained substantial interest. This study addresses the multiple potential of corn agricultural waste, focusing on its dual utility: cellulase production and enhanced polyphenols extraction.

Aspergillus welwitschiae FAW1 and *Aspergillus tubingensis* FAT36 strains, isolated from the environment, has proven to be good producers of the cellulase enzyme complex and at the same time non-toxicogenic and safe for use in food production [1]. Due to the fact that most of the fungal enzymes are inducible [2,3,4], the substrates used in this solid-state fermentation were agro-waste materials rich in cellulose and hemicellulose (corn silk and corn cob). The cellulase complex was produced by growing fungal strains at 28 °C for 96 h.

Through enzyme assisted extraction, the release of polyphenols from corn silk was enhanced. The obtained extracts, whether we used FAW1 or FAT36 strain's cellulase enzyme complex showed an increase in total phenolic content, ranging from 876 mg/mL to 3050 mg/mL and 2944 mg/mL, respectively, which was determined by the Folin Ciocalteu method. Increasing the amount of extracted polyphenols led to the two to three times higher antioxidant activity of the extracts, according to ABTS and FRAP methods.

This enzymatic approach offers a sustainable and eco-friendly alternative to conventional extraction methods, mitigating environmental impact while enhancing product purity. These findings not only contribute to the valorization of agricultural waste, but also emphasize the potential of corn agro-waste as a versatile resource for bioprocessing applications, connecting enzyme production, natural product extraction and added value products obtaining.

References :

- [1] Stojanović, S., Stepanović, J., Špirović Trifunović, B., Duduk, N., Dojnov, B., Duduk, B., Vujčić, Z.; Food Technology and Biotechnology, 60 (2022) 421.
- [2] Grujić, M., Dojnov, B., Potočnik, I., Duduk, B., Vujčić, Z.; International Biodeterioration & Biodegradation 104 (2015) 290e298.
- [3] Stojanović, S., Ristović, M., Stepanović, J., Margetić, A., Duduk, B., Vujčić, Z., Dojnov, B.; Food Research International., 160 (2022) 111755.
- [4] Margetić, A., Stojanović, S., Ristović, M., Vujčić, Z., Dojnov, B.; LWT - Food Science and Technology, 145 (2021) 111291.

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Acknowledgments: This research was supported by the Science Fund of the Republic of Serbia, #7347, Unique enzyme solutions for obtaining added value products from corn – UniCorn and the Ministry of Science, Technological Development and Innovation of Republic of Serbia (Contract numbers: 451-03-66/2024-03/200026 and 451-03-65/2024-03/200168).

Keywords:

Cellulase, *Aspergillus* spp., corn, agro-waste, polyphenols