proceedings

Abstract

Mycobiota and Mycotoxin Content of Cereal Flours from a Serbian Market †

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† Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Altogether, 39 cereal flour samples taken from a Serbian market were analyzed for mycobiota and mycotoxin content, among which were six *Triticum aestivum* specimens, five *Triticum dicoccum* specimens, four *Hordeum vulgare* specimens, five *Fagopyrum esculentum* specimens, three *Secale cereale* specimens, five *Triticum spelta* specimens, four *Avena sativa* specimens, two *Oryza* sativa specimens, two *Zea mays* specimens, and one specimen each of *Panicum miliaceum*, *Triticum monococcum*, and *Triticum turgidum* ssp. turanicum. To determine the mycobiota content using dilution techniques, the flour samples were transferred to a non-selective DG18 nutrient. The number of colony-forming units (CFU/g) varied from less than 100 (in the case of five samples, namely, two *O. sativa*, and one specimen each of *S. cereale*, *H. vulgare*, and *T. aestivum*) to as high as 5000 CFU/g (*S. cereale*), 6000 (*A. sativa*), 11,000 (*T. aesticum*), and 40,000 (*Z. mays*). The identification of fungal genera and species was performed on Czapex-Dox Agar and Potato dextrose Agar on the basis of the isolates' colony characteristics and the morphology of the examined reproductive organs. The isolated fungi belonged to the following genera: *Aspergillus*, *Penicillium*, *Alternaria*, and *Fusarium*. Species from these genera are well-known mycotoxin-producing fungi. Among the identified species were *A. candidus*, *A. flavus*, *A. carbonarius*, *A. ochraceus*, *A. oryzae*, *P. solitum*, *P. citrinum*, *P. griseofulvum*, *P. brevicompactum*, *A. alternata*, *F. avenaceum*, and *F. graminearum*. The mycotoxin content was determined via the ELISA technique using Eurofins Technologies Hungary KFT kits for aflatoxin B1, deoxynivalenol, total aflatoxins, ochratoxin A, and zearalenone. In the case of eighteen samples, the total aflatoxin content was above the limit of detection, and seven of these samples were contaminated with aflatoxin B1, eight were contaminated with ochratoxin A, two were contaminated with dexynivalenol, and one was contaminated with zearalenon. Two samples of *T. aestivum* were contaminated with one or more toxins (33%), and the number of samples contaminated three for *T. dicoccum* (60%), one for *H. vulgare* (25%), four for *F. esculentum* (80%), one for *S. cereale* (33%), two for *T. spelta* (40%), three for *A. sativa* (75%), two for *O. sativa* (100%), two for *Z. mays* (100%), one for *P. miliaceum* (100%), one for *T. monococcum* (100%), and one for *T. turgidum* ssp. turanicum (100%).

Keywords: cereal flour; mycobiota; mycotoxin

Citation: Bagi, F.; Todorić, O.; Belović, M.; Radosavljević, M.; Barać, G.; Iličić, R.; Torbica, A. Mycobiota and Mycotoxin Content of Cereal Flours from a Serbian Market. *Proceedings* **2023**, *91*, 275. https://doi.org/10.3390/proceedings2023091275

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 6 February 2024

Author Contributions: Conceptualiyation, F.B. and A.T.; methodology G.B., R.I., O.T. and M.B.; software F.B. and G.B.; validation G.B. and R.I.; formal analysis F.B., G.B., R.I., M.B. and O.T.; investigation F.B., R.I., G.B., A.T., O.T., M.B. and M.R.; resources A.T.; data curation G.B. and R.I.; writing—original draft preparation F.B.; writing—review and editing A.T.; visualization G.B., O.T. and F.B.; project administration A.T.; funding aqusition A.T. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the Science Fund of the Republic of Serbia, IDEAS program, Grant No. 7736059, through the project "Biotechnological tools for optimization of short and medium chain carbohydrates content in cereal-based food to prevent gastrointestinal disorders GutFriendlyCarbs".

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.