DEVELOPMENT OF MUSHROOM-BASED CEREAL FLOURS WITH IMPROVED NUTRITIONAL AND ANTIOXIDATIVE PROPERTIES

Dunja Miletić[1*], Aleksandra Sknepnek[1], Nataša Milićević[2], Milena Pantić [1], Marijana Sakač[2], Bojana Šarić[2], Miomir Nikšić[1]

[1]University of Belgrade, Faculty of Agriculture, Institute of Food Technology and Biochemistry, Department of Industrial Microbiology, Belgrade, Serbia
[2]University of Novi Sad, Institute of Food Technology, Novi Sad, Serbia

** Corresponding author: dunjaduvnjak@gmail.com*

Introduction

Mushrooms are a great source of the nutritionaly valuable compounds, including polysaccharides, polysaccharopeptides, proteins, and phenolic compounds, and thus they have been used in human diet for centuries. Edible and medicinal mushrooms are also a source of a valuable bioactive compounds, and have a favorable impact on the human health. Thus, they are used in preventing diseases and as an alternative therapy in fighting against oxidative stress.The mushroom favorable nutritional composition as well as the the fact that they contain biologically active compounds is used for the production of mushroom-based cereal flours. Three different cereals were inoculated using three selected mushrooms: *Pleurotus ostreatus* as one of the most important edible mushroom, cultivated world-wide on the large scale; *Lentinus edodes,* the second most cultivated and also medicinal mushroom; and *Trametes versicolor,* non-edible, but known for its medical properties.

Production of the cereal grains enriched with mushrooms

Cereals used for flours production:
- **Wheat** (NS 40 S),
- **Rye** (individual agricultural holding, Vojvodina province)
- **Oat** (Italico d.o.o).

Mushroom strains used for cereals inoculation:
***Pleurotus ostreatus* HK-35;**
Lentinus edodes M3776,
Trametes versicolor

Incubation (25±2 °C, 20-30 days in the dark), **drying** (40° C) and **milling**.

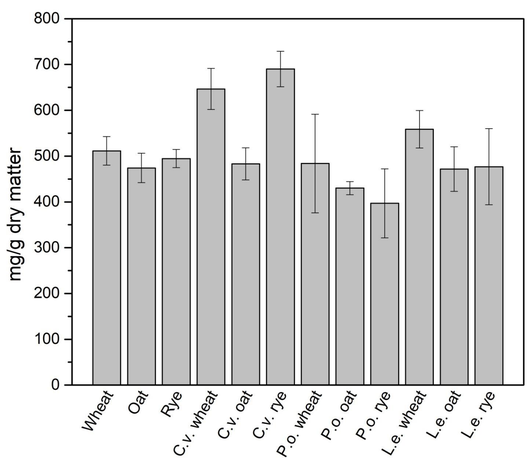
Chemical characterization and antioxidative activity determination methods

Total proteins (AOAC, 2020; (Method No. 950.36)).
Total carbohydrates (DuBois et al., 1956).
Total phenolic compounds (Matijašević et al., 2016).

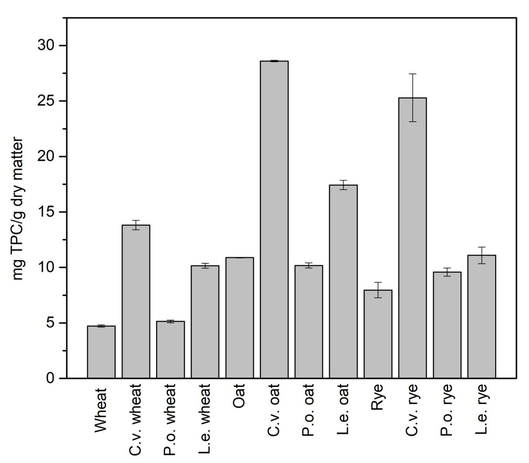
Reducing power and Chelating ability (Kozarski et al., 2011).

Single-factor analysis of variance (ANOVA); Origin Pro 9.0. Fisher's LSD test ($p \leq 0.05$).

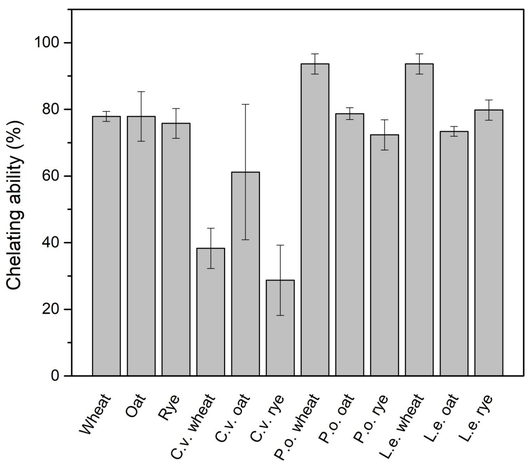
Results and discussion



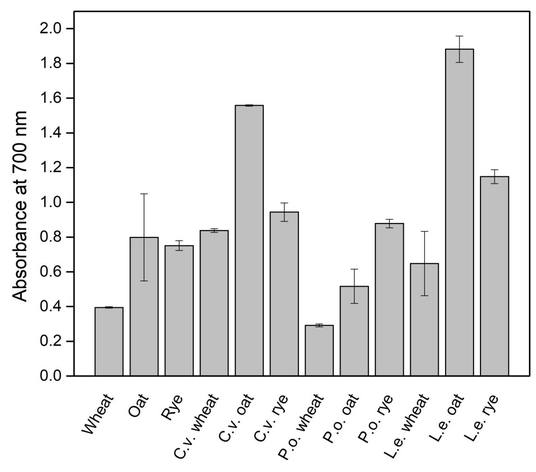
Total carbohydrate content (mg/g)



Total phenolic compound content (mg/g)



Chelating ability (%)



Reducing power

Conclusions

Obtained results revealed that the growth of different mushrooms on different cereals is a promising method for the production of flours with increased bioactive components from mushrooms in order to for enhance their antioxidative potential.

Chemical characterization

All mushroom enriched flours had **incereased protein content**. The highest content was determined for *P. ostreatus* wheat and *L. edodes* oat flours.

The highest total carbohydrate content was in *T. versicolor* wheat (705.61±48.97 mg/g) and rye (749.15±42.09 mg/g) grain flours.

Expand in total phenolic compounds content, between 7.72±0.39 and 217.74±54.65 %, in eight out of nine tested enriched samples, compared to the control.

Antioxidative activity

Significant **increase ($p<0.05$) of chelating ability** was observed for *P. ostreatus* and *L. edodes* wheat grain flours (93.62±3.01 %).

Significantly **higher reducing power** ($p<0.05$) was detected in six out of nine tested samples.

The highest absorbance was measured for *L. edodes* oat (1.88±0.08) and rye (1.15±0.04) grain flours.

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