

Antibacterial activity and total phenol content in Wheat extracts**Научный руководитель – Djukic Dragutin*****Durović Vesna Milan****PhD*

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Wheat (*Triticum* species) is a cereal grass, the world's most used grain for human consumption. It is source of various phytochemical molecules [5]. Studies have shown that many of the phytocompounds possess anti-inflammatory, anti-diabetic and antimicrobial activities [2]. Wheat products contain high levels of antioxidants from phenols which confer protection against diseases [1].

The aim of the study was determined the phenolic content in extracts of wheat varieties from Serbia (Pobeda, NS-40 and Illico). Antimicrobial activity was determined in sample which showed the most Total Phenolic Content (TPC).

Ground grain was defatted with hexane and air dried for 12 h. The extracts were prepared by extracting the ground wheat (5 g) with 50 mL of solvent (50% ethanol) with two extractions: ultrasonic and maceration. TPC were determined using a Folin-Ciocalteu method [4]. Gallic acid (GA) was used as standards. Total flavonoid content was determined using a colorimetric method [5]. Antibacterial activity was determined by method minimal inhibitory concentration (MIC). Concentrations of extracts from 100 to 0.0976 mg mL⁻¹ were used.

The total phenol and flavonoid content were higher in extracts obtained by ultrasound extraction compared to the maceration in all varieties. NS-40 extract obtained by ultrasound extraction has showed the highest content of total phenols (2.59 mg of GAE/g) and flavonoids (102 µg RE g⁻¹ DW). Wheat extract (NS-40) did not showed antimicrobial effect in any concentration to *Bacillus spizizenii* ATCC 6633; *Salmonella typhimurium* ATCC 14028; *Pseudomonas aeruginosa* ATCC 27853 and *Proteus mirabilis* ATCC 35659. Thus, extract showed antimicrobial effect on *Staphylococcus aureus* ATCC 25923 (range 100 to 0.0976 mg mL⁻¹). The minimal inhibitory concentration for *Listeria ivanovii* ATCC 19119 and *Escherichia coli* ATCC 25922 was 1.5625 and 0.3906, respectively.

References

- 1) Adom, K.K., Sorrells, M.E., Liu, R.H.: Phytochemicals and antioxidant activity of milled fractions of different wheat varieties. *J. Agric. Food Chem.* 2005.53, p.2297–2306.
- 2) Joan, I.A, Tofte, C., Molgaard, P., Winther, K.: Harnessing the Potential Clinical Use of Medicinal Plants as Anti-Diabetic Agents. *Botanics: Targets and Therapy.* 2012; 2: p.7-19.
- 3) Markham, K.R.: Flavones, flavonoids, and their glycosides: Harborne, J.B., Dey, P.M. (Eds.), *Methods in Plant Biochemistry.* Academic Press Ltd. London, UK. 1989
- 4) Singleton, V.L., Orthofer, R. & Lamuela-Raventos, R.M.: Analysis of total phenols and other oxidant substrates and antioxidants by mean of Folin – Ciocalteu reagent. In: *Methods in Enzymology. Oxidant and Antioxidant (part A)* (edited by L. Packer).1999. p.152-178. San Diego, USA: Academic Press.

- 5) 5. Zheng, W. and Wang, S.Y.: Antioxidant Activity and Phenolic Compounds in Selected Herbs. *Journal of Agricultural and Food Chemistry*. 2001; 49: p.5165-5170.