



University of Belgrade - Faculty of Agriculture

1<sup>st</sup> European Symposium on  
Phytochemicals in Medicine and Food  
(1-EuSPMF)

Book of abstracts

Belgrade, Serbia  
7-9 September 2022

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## VII\_PP6\_Oat varieties with different hull colours as potential sources of phytochemicals for the food and feed industry

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Whole grain cereals are considered essential components of nutrition because of their health-promoting properties. Oats (*Avena sativa* L.) are naturally gluten-free cereals suitable for persons suffering from celiac disease, abundant in dietary fibre, among which particularly  $\beta$ -glucans offer medical advantages like lowering cholesterol levels, reducing glucose uptake, and decreasing plasma insulin levels [1,2]. Nevertheless, oats are abundant in phenolic acids, flavonoids, carotenoids, vitamin E, and phytosterols [3,4]. This study aimed to investigate the antioxidant properties of the dehulled grain and hulls of three oat genotypes with different hull colours: yellow, brown and black. The contents of total phenolic compounds, phenolic acids,  $\beta$ -glucan, and antioxidant capacity of the oat grains and oat hulls were analysed. Significant differences were noticed among the tested samples, especially between parameter values determined in hulls, compared to those in grain. Oat hulls had higher contents of total phenolic compounds (11320.11-24352.48  $\mu\text{g GAE/g d.m.}$ ) compared to grain (841.89-982.08  $\mu\text{g GAE/g d.m.}$ ); as well as the detected phenolic acids, namely: *p*-coumaric, ferulic, isoferulic, vanillic and syringic acid. Ferulic acid was predominant, in both the grain (395.88-589.14  $\mu\text{g/g d.m.}$ ) and hulls (4987.02-13794.82  $\mu\text{g/g d.m.}$ ). The antioxidant capacity was higher in oat hulls, also, ranging from 42.31 mmol Trolox/kg d.m., in yellow hulls to 53.16 mmol Trolox/kg d.m. in brown hulls, and from 22.61 mmol Trolox/kg d.m. in black grain, to 25.06 mmol Trolox/kg d.m. in brown grain. Conversely, the  $\beta$ -glucan content determined in the grain samples was significantly higher, ranging from 4.07% to 5.33% in grain, and only 0.03-0.06% in hulls. The anthocyanins and proanthocyanidins were not detected, which indicates that the colour of the oat varieties did not originate from these pigmented bioactive compounds. The investigated oat genotypes exhibit notable potential for use by the food and feed industries as sources of phytochemicals with potential health-promoting benefits.

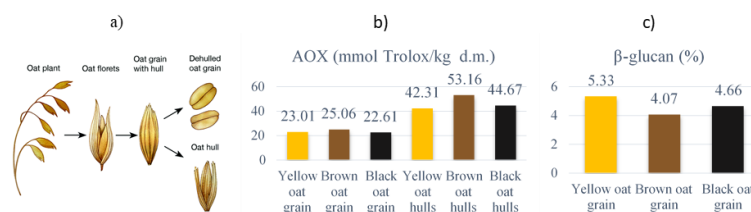


Figure 1. Hulled oat constituents a); antioxidant capacity b);  $\beta$ -glucan content

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