

## **Antioxidant Activity of Extracts from Polish Flax Varieties**

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The aim of the study was to compare the antioxidant activity of extracts obtained from three Polish flax varieties: Szafir (brown seeds), Oliwin and Jantarol (both golden seeds). Two types of extracts were investigated: aqueous and 60% aqueous ethanol. The antioxidant properties of the extracts were determined applying the ABTS<sup>•+</sup>, FRAP and Fe<sup>2+</sup>chelating tests. Moreover, the content of lignans, phenolic acids and their derivatives were determined using HPLC. The content of proteins and amino acid composition was also analysed by UPLC.

Both aqueous and ethanolic extracts showed relatively high antiradical and reducing activities but rather weak iron-chelating ability. The properties were dependent on the flax variety and the type of extract. The extracts from brown seed variety had the highest antioxidant activity. The ethanolic extracts were observed to have approximately 10-fold higher antioxidant activity than the aqueous ones and it was related to the content of phenolic compounds.

It was found that the content of phenolic compounds was 10 and 6-fold higher in ethanolic extracts than in aqueous from brown and golden seed varieties, respectively. Secoisolariciresinol (SDG), as well as *p*-coumaric and ferulic acid and their glucosides, were the main phenolic compounds of all extracts. Moreover, phenolic acid esters were found in ethanolic extracts. The highest total content of phenolic compounds and SDG was observed in ethanolic extract from Szafir var. However, both aqueous extracts from golden seed varieties had significantly higher content of phenolic compounds than the aqueous extracts from brown seeds. It suggests that besides natural phenolics other compounds are involved in antioxidant activity of the aqueous extracts. The highest content of proteins was observed in the aqueous extract from seeds of Szafir var. Moreover, more arginine and glutamic acid were detected in the extract than in the others.

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