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Change of polyphenols composition during fermentation of buckwheat flour by lactic acid bacteria

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Common buckwheat (*Fagopyrum esculentum*) is an important crop in some areas of the world. There is some evidence indicating that consumption of buckwheat is associated with a wide range of biological functions, including hypocholesterolemic, hypoglycemic, anticancer, anti-inflammatory and anti-glycation effects. These properties are related to polyphenols that are present in buckwheat at a high level, increasing an interest in buckwheat products as a substitute for wheat flour in the production of gluten-free products. The aim of this study was to investigate the effects of fermentation using lactic acid bacteria on the profile of phenolic acids and flavonoids. Material for the study was buckwheat flours are whole meal and thermally treated flours. The fermentation using 14 selected lactic acid bacteria was performed in a 5% buckwheat flour suspension at 37°C for 24 hours. Qualitative and quantitative analysis of phenolic acids and flavonoids in buckwheat flours before and after fermentation were determined by micro-HPLC system equipped with QTRAP 5500 mass spectrometer (SCIEX, Canada). In buckwheat flours before and after fermentation eight flavonoids (quercetin, isorhamnetin, kaempferol, epicatechin, apigenin, luteolin, orientin and vitexin) and 10 phenolic acids (ferulic, caffeic, sinapic, *para*-coumaric, *meta*-coumaric, chlorogenic, *trans*-cinnamic, protocatechuic, vanillic, syringic) were analyzed. Among flavonoids, epicatechin was a main compound while in the group of phenolic acids, ferulic acid was predominant. Generally, fermentation process decreased the concentration of polyphenols studied but on the other hand caused an increase of the polyphenols concentration in a free forms. Moreover, the applied lactic acid bacteria significantly changed polyphenols profile in the fermented buckwheat flours.

Biography

Wieslaw Wiczowski has completed his PhD in Food Chemistry and Human Nutrition from the University of Warmia and Mazury, Olsztyn, Poland. His professional interest is connecting with the relation between nutrition, metabolism of bioactive compounds, oxidative stress and health. He has published 39 papers in reputed journals.

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