

Identification of free phenolic compounds from black mustard: a comparative analysis between non-germinated and germinated grains

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Abstract (Scientific Text) - (Maximum 300 words):

Germination is a good option to change the biological properties of grains mainly due the complex and dynamic transformation of bioactive compounds that occur naturally during this process. Black mustard (*Brassica nigra*) was the specie chosen to analyze the germination effects on phenolic compounds profile of extracts produced with these grains. The germination process was performed for 48h at 25°C with alternating periods of light and dark. The samples were freeze-dried, defatted and frozen at -18°C. The soluble fraction from mustard was obtained using as solvent a mixture of acetone and water in equal proportions, 20 minutes as incubation time and agitation of 150 rpm in a rotatory shaker; this process was repeated three times. After that, the solvent was removed and the extract was freeze-dried. The antioxidant properties were investigated using the following methods: ABTS- and DPPH-radical scavenging activities, the Oxygen Radical Absorbance Capacity (ORAC) and the Ferric Reducing Antioxidant Potential (FRAP). An aliquot of 10 µL of each diluted extract in methanol was injected and the identification of the phenolic compounds was performed by UPLC-MS/MS. The results showed different phenolic profiles on extracts produced from non-germinated and germinated mustard grains. 3,4-di-hydroxybenzoic acid; ferulic acid,

rutin, quercitin and sinapic acid were found for non-germinated samples and, rutin, ferulic acid and sinapic acid were detected after germination. Our results showed for the first time the presence of two flavonoids compounds in mustard grains – rutin and quercitin. The changes in the profile of bioactive compounds after germination could be one of the reasons of the increase in antioxidant activity of the black mustard extracts , since it was observed values of 29%, 3%, 160% and 42% higher for FRAP, DPPH, ABTS and ORAC, respectively, compared to the non-germinated samples.

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