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Effects of carbohydrase on phenolic acid and antioxidant activity of brown rice flour

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Abstract

Brown rice flour (BRF) was treated with different carbohydrases (Viscozyme, Termamyl, Celluclast, AMG, Ultraflo, and Pentopan), and then aqueous alcoholic extracts (70% ethanol) from the treated RBF were examined for their phenolic compositions and antioxidant activities (ABTS and DPPH radical scavenging activity). All the carbohydrases tested induced significant increases in ABTS radical scavenging activity (2.1-3.0 times). Moreover, These enzymes increased the amount of extractable free phenolic acids by 10-15 times, especially for ferulic and *p*-coumaric acid. Among the enzymes tested, Pentopan which was active in arabinoxylan hydrolysis appeared to be most effective in increasing the free phenolic acid content and ABTS radical scavenging activity than other enzymes. Enzymatic hydrolysis of cell wall polysaccharides in BRF could be used as an effective procedure for raising the amount of extractable phenolic acids and thus increasing the antioxidant activity of BRF extract.

Keywords: Carbohydrase, brown rice, phenolic acid, antioxidant activity

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