Comparison of Total Phenolic Content and Antioxidant Activity of Some Gluten-Free Flour

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People suffering from gluten-related disorders must follow a lifelong gluten-free diet. Therefore, scientists, health experts, and food manufacturers are evaluating different ingredients to develop gluten-free formulations that are superior in terms of nutritional, sensorial, and functional aspects. This study aimed to compare the total phenolic content (TPC) and antioxidant activity of some gluten-free flour sold on the market. Almond, coconut, quinoa, teff, tapioca, and white mulberry flour samples were analyzed in terms of TPC by the Folin-Ciocalteu method using gallic acid (GA) as standard, and antioxidant activity with the 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis-(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging assays. The TPC of tapioca, coconut, almond, teff, quinoa, and white mulberry flour samples were determined as 0.673±0.014, 1.634±0.031, 2.223±0.057, 2.869±0.033, 4.076±0.054, and 9.973±0.361 mg GAE/g dry weight, respectively. The antioxidant activity of tapioca, coconut, almond, teff, quinoa, and white mulberry flour samples in terms of DPPH assay was found as 0.731±0.084, 1.343±0.105, 2.182±0.132, 2.778±0.077, 2.168±0.117, and 5.513±0.073 mg TE/g dry weight, respectively. On the other hand, the data obtained in the ABTS assay for the same samples were 0.260±0.013, 0.616±0.037, 1.233±0.053, 0.925±0.036, 0.819±0.039, and 2.315±0.050 mg TE/g dry weight, respectively. Moreover, a positive relation between TPC and antioxidant activity (DPPH and ABTS) was observed for flour types by Pearson's correlation coefficient, which varied between 0.790 and 0.984 ($p<0.05$). White mulberry flour was found to have the highest TPC and antioxidant activity ($p<0.05$), which was followed by quinoa flour in terms of TPC, teff flour (DPPH) and almond flour (ABTS) in terms of antioxidant activity. Among the flour types analyzed, white mulberry flour in particular could be a good ingredient to produce functional gluten-free products.

Keywords: *Antioxidant activity, Flour, Functional, Gluten-free, Phenolic content*