

Phenolic content and antioxidant activities of millet grains as affected by solvents and extraction methods

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Phenolic compounds ubiquitously found in plants act as effective natural antioxidants. Millets are underutilized cereals even in millet producing countries but are good source of phenolics. In the present study, the effect of extraction solvent and conditions on the total phenolic content (TPC), total flavonoid content (TFC), and proanthocyanidins contents (PC), and antioxidant activities of millet grains were investigated. Three solvent systems, namely 70% acetone, 80% methanol, and 80% methanol with 1% HCl were used. The extraction method used was refluxing at 60⁰C, followed by shaking in a water bath at 50⁰C and room temperature. The TPC measured using Folin Ciocalteu's reagent of finger and foxtail millets differed from 34 to 111 and 4 to 14 μmol ferulic acid equivalents (FAE)/g defatted meal, respectively. The TFC and PC contents of finger and foxtail millets were in the range of 0.3–12.0 and 0.1–5.0 μmol of catechin equivalents (CAE)/g of defatted meal, respectively. Aqueous methanol with HCl was found to be the most effective solvent system among others used in this study, and gave the highest TPC for finger and foxtail millet grains under refluxing extraction. However, antioxidant activities, as determined by reducing power (RP), trolox equivalent antioxidant capacity (TEAC) and oxidation inhibition of β carotene in the β carotene-linoleate system differed depending on the extraction techniques used. In conclusion, the results of this study demonstrated that the solvent system as well as the extraction method influenced the extraction efficacy of phenolic compounds in millet grains and their antioxidant activities.

Key words: Finger millet, Foxtail millet, Total phenolics, TEAC

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