

Comparison of Proximate Composition, Phenolic Content and Flavonoid Content of Raw and Malted Foxtail Millets Grown in Northern Province of Sri Lanka

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Foxtail millet is the one of widely planted species of millet in most parts of East Asia. It is a small seeded grain with a major source of calories, essential micronutrients, phytochemicals, vitamins, phenolic compounds, minerals and nutraceuticals, constituting a vital component of food security in developing countries. The grain is processed in many ways for preparation of various food products. Malting is one of the processing methods which enhance the nutritive value of the Foxtail millets by its hydrolytic activity. In this study, the effect of different malting duration such as 12 h, 24 h and 48 h on the proximate composition, total phenolic content (TPC) and total flavonoid content (TFC) of the foxtail millets were evaluated. For this purpose, foxtail millet (600g) was steeped for 24 hours in water (grain: water at the ratio of 1:2) at room temperature (28 °C) in a stainless-steel bowl. To prevent fermentation, the water in the bowl was replaced every 6 h with fresh water. Finally, the water was drained and grains were spread as thin layer over a moist muslin cloth for germination for different durations as treatments (12 h, 24 h, and 48 h). The germinated grains were sun-dried for 3 days, and manually cleaned to remove the foreign particles and the malted grains were ground and sieved to obtain the flour. The samples were analyzed for moisture, protein, carbohydrate, fat, ash and fiber contents and TPC and TFC. The proximate analysis revealed that the moisture content was significantly ($p \leq 0.05$) increased from 4.620 ± 0.88 to $7.54 \pm 0.03\%$. The total sugar content of the Foxtail millets ranged between 0.1200mg/mL to 0.1595 mg/mL with no significant difference ($p \leq 0.05$) for raw and malted flours. The reducing sugar content and fiber content had increased significantly ($p \leq 0.05$) with malting duration from 0.0866 mg/mL to 0.1859 mg/mL, $10.55 \pm 0.187\%$ to $13.556 \pm 0.113\%$ respectively. The crude protein content of foxtail millets significantly increased ($p \leq 0.05$) from $5.045 \pm 0.028\%$ to $11.825 \pm 0.070\%$ with increased malting duration. The significant increase ($p \leq 0.05$) in TPC from 0.2747 ± 0.0026 mg gallic acid equivalent/100g to 0.334 ± 0.0044 mg gallic acid equivalent/100g was reported during malting, whereas the TFC was increased significantly ($p \leq 0.05$) during malting with higher value (0.0369 ± 0.001 catechin equivalent mg/100g) reported at 24h of malting. The findings of this study demonstrated that malting for 24 h could be employed as a processing technique to improve the nutritional value of Foxtail millets-based foods.

Keywords: Foxtail millets, Malting, Nutrient