

## PC-16

**Comparison of Popular Sorghum Cultivars Using Agronomical, Nutritional, and Biochemical Properties**

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**[Introduction]**

Sorghum (*Sorghum bicolor* (L.) Moench) is a drought-tolerant and stress-resistant crop that can be grown in water-stressed regions. The crop is high in nutritional and non-nutritional metabolites that need to be studied further. Temperature, growth conditions, cultivation year, and disease, among other biotic and abiotic factors, all have an impact on the agronomical characteristics, metabolite contents, and nutritional values of crops. As a result, the performance of crop genetic materials should be continuously examined to aid in the development of improved cultivars. This study aimed to look into three popular sorghum cultivars: Nampungchal (from Korea), Sodamchal (from Korea), and Wheatland (from the United States) in terms of their agronomical performance, nutritional qualities, biochemical contents, and antioxidant activities.

**[Materials and methods]**

Seeds of the sorghum cultivars were obtained from the National Agrobiodiversity Center (Jeonju, Republic of Korea), and field cultivation was carried out in the center's experimental farm. Field and laboratory inspections were used to document the agronomic performance of the cultivars. Using standard protocols, the total protein, total fat, crude fiber, and dietary fiber contents were calculated. The fatty acid content was measured using a gas chromatography instrument equipped with a flame ionization detector (GC-FID). Colorimetric assays were used to determine total phenolic content (TPC), total tannin content (TTC), 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity, 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium (ABTS) radical cation scavenging activity, and ferric reducing antioxidant power (FRAP). The variation of each was determined using analysis of variance at a significance level of  $p < 0.05$ .

**[Results and discussion]**

The agronomic characteristics, nutritional contents, biochemical levels, and antioxidant capacities of the sorghum cultivars varied significantly ( $p < 0.05$ ). Wheatland flowered and matured the fastest, at 47 and 88 days, respectively. It also had the greatest one-thousand seeds weight (37.93 g). The total fat and dietary fiber contents decreased in the order of Nampungchal < Sodamchal < Wheatland, while total protein and crude fiber content showed the opposite trend. Wheatland had the lowest oleic acid content and the highest linoleic and linolenic acid content when compared to Korean cultivars. TTC and TPC levels were in the order of Nampungchal < Sodamchal < Wheatland, and antioxidant capacities followed a similar pattern, indicating that these metabolites play a part in controlling reactive radicals. The observed findings were also supported by the correlation analysis. In conclusion, Wheatland could be an excellent source of protein and polyunsaturated fatty acids. In contrast, the Korean cultivars could be best used as antioxidant sources.

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