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Analysis of Crop Growth Characteristics, the Activity and Content of Seed Antioxidants of Finger Millet [*Eleusine coracana* (L.) Gaertn] Treated with Planting Times in Gangwon Province of Korea

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[Introduction]

Finger millet [*Eleusine coracana* (L.) Gaertn] is a small grain millet belonging to the Poaceae family, which is rich in calcium and has higher antioxidative activity than other millets. The growth and nutritional content of seed are affected by the planting time. This study investigated the crop growth characteristics, the activities and contents of seed antioxidants by treatment of planting time in order to find the changes in productivity and antioxidant components of the finger millet seed.

[Materials and Methods]

The finger millet varieties used was ‘Finger No. 1’ developed by the Rural Development Administration, and the field experiments were tried in Hwacheon and Inje of Gangwon-do from 2020 to 2021. The planting was 2 times at late-May and mid-June in Hwacheon, and 3 times at late-May, mid-June, and late-June in Inje. The crop growth characteristics determined were heading date, total growth period, plant height, one spike dry weight, and seed yield. The seed chemicals quantified were calcium, and total polyphenol and flavonoids as antioxidants. The antioxidant activity were determined by DPPH and ABTS radical scavenging ability.

[Results and Discussion]

As the planting time was delayed from late-May to late-June, the heading date was delayed from early-Aug. to late-Aug. The plant height and seed yield were the highest in late-May in all treatments. The one spike dry weight was high in mid-June. The calcium content of finger millet seed was ranged from 198.8 to 346.5 mg/100g in all treatments. It showed the highest of 306.6 mg/100g at late-June in Hwacheon, and 243.4 mg/100g at late-May in Inje. The DPPH, ABTS radicals scavenging ability, and the contents of total polyphenol and flavonoid were high at late-June in Hwacheon. The Pearson correlation analysis showed that there was a significant positive correlation among the one spike dry weight, the DPPH radical scavenging ability and the total phenol content. Therefore, seed production was the highest at late-May planting. On the other hand, the activity and content of antioxidants such as DPPH radical scavenging ability and total phenol content were the highest at mid-June planting, when the one spike dry weight was high.

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