

PA-28

## Changes of the Content and the Activity of Seed Antioxidants by Milling and the Ripening Stage of Finger Millet [*Eleusine coracana* (L.) Gaertn]

Hye Won Jun<sup>1</sup>, Yi Kyeoung Kim<sup>1</sup>, Hyun Joo Kim<sup>2</sup>, Wook Kim<sup>1</sup>, Sei Joon Park<sup>3\*</sup>

<sup>1</sup>Department of Plant Biotechnology, Korea University, Seoul 02841, Korea

<sup>2</sup>National Institute of Crop Science, RDA, Korea

<sup>3</sup>Institute of Life Science and Natural Resources, Korea University, Seoul 02841, Korea

### [Introduction]

Finger millet [*Eleusine coracana* (L.) Gaertn] is a small grain millet that is useful for poor environments grown in semi-dry areas in Asia and Africa, and is reported as health supplement crop with high calcium and antioxidants of seeds. In particular, antioxidants are concentrated in the seed coat. This study is examined the changes of the content and the activity of seed calcium and antioxidants by milling and the ripening stage to evaluate the value as a nutraceutical crop of the finger millet

### [Materials and Methods]

The finger millet cultivar used was 'Finger No. 1' developed by the Rural Development Administration, and the field experiments were tried in Hwacheon of Gangwon-do from 2020 to 2021. The planting was done at May 26 in 2020 and at May 15 in 2021. Spike samples were performed with three times at an interval of 2 weeks for maturity periods. The seed chemicals quantified were calcium and the antioxidants such as total polyphenol and flavonoids. The antioxidant activity were determined by DPPH and ABTS radical scavenging ability.

### [Results and Discussion]

There was no significant difference in seed calcium content depending on whether or not the milling, and the average content was 236 mg/100g. On the other hand, the DPPH, ABTS radical scavenging ability, the total polyphenol and flavonoid content were significantly high in unmilled seeds. This suggested that calcium in the seeds was mainly accumulated in the endosperm, and total phenol and flavonoids were mainly accumulated in the seed coat. During the maturity period, the calcium content was increased, whereas the DPPH, ABTS radical scavenging ability, the total polyphenol and flavonoid content were slightly decreased. This indicated that calcium was accumulated continuously during the maturity period, and the total polyphenols and flavonoids was in the early stages of maturity. DPPH radical scavenging ability, total phenol and flavonoid content showed a highly positive correlation with the one spike dry weight. These results suggested that the accumulation of seed chemicals related to antioxidant function of finger millet was mainly affected by the one spike dry weight.

### [Acknowledgement]

This research was supported by a grant from the Agenda project of Rural Development Administration (project number: PJ0153352022)

\*Corresponding author: E-mail, hiswman@korea.ac.kr Tel, \*\*\* - \*\*\*\* - \*\*\*\*