

## $\alpha$ -Glucosidase Inhibitory Activity of Luteolinidin from Sorghum

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### [Introduction]

*Sorghum bicolor*(L.) is a rich source of various phytochemicals that have potential to significantly impact human health. Sorghum possess anti diabetic effects in vitro relative to other cereals or fruits. In sorghum, the most common anthocyanin types are the 3-deoxyanthocyanidins, which include luteolinidin and apigeninidin, are not commonly found in other plants. The present study was designed to (1) evaluate the  $\alpha$ -glucosidase inhibitory activity of luteolinidin and (2) quantify the luteolinidin of 150 sorghum genotypes.

### [Materials and Methods]

Standard compounds were subjected to  $\alpha$ -glucosidase inhibitory assay. The enzyme assay was usually performed using a UV spectrophotometer to detect the increase at 405 nm and inhibitor concentration leading to 50% activity loss (IC<sub>50</sub>) was obtained.

The 150 sorghum genotypes were collected from field in Miryang 2017. The pulverised sorghum samples were extracted with methanol (1% HCl). The extraction protocol involved the additional of 3ml of solvent to 0.5g of sample and shaking the samples for 2h. The quantification of anthocyanins in the seeds of sorghum accessions were carried out using Ultimate 3000 HPLC analysis. Separation was on a reversed phase YMC triart C18-1.9 $\mu$  m(50 $\times$ 2 mm) column. Flow rate was 0.4ml/min; injection volume, 5 $\mu$  l; column temperature, 30 $^{\circ}$ C; detection, 480-520 nm. The mobile phase was (A) 0.1% acetic acid in water, and (B) 0.1% acetic acid in acetonitrile:water(6:4). Gradient was; 0-2min, 12.5% B isocratic; 2-5 min, 12.5-30% B; 5-7.5min, 30% B; 7.5-10min, 40% B; 10-12.5min, 40% B; 12.5-15min, 100% B; 15-18min, 100% B; 18-19min, 12.5% B; 19-25min, 12.5% B isocratic.

### [Results and Discussions]

Luteolinidin has shown  $\alpha$ -glucosidase inhibitory moderately with IC<sub>50</sub> values of 217 $\mu$  M. The inhibition kinetics analyzed by Dixon plots indicates that a luteolinidin is noncompetitive inhibitor and inhibition constant,  $K_i$ , was established as 138.7  $\mu$  M. A group of 150 samples revealed a wide range of variability for luteolinidin(0~339.1 $\mu$  g/g). Some genotypes including R3338(339.1 $\mu$  g/g), SC6(321.5 $\mu$  g/g), SA413 Dwarf redlan(310.7 $\mu$  g/g) were identified with high levels of the luteolinidin that have unique color stability and potential health applications including  $\alpha$ -glucosidase. It should be expanding the sorghum use in the health food industry.

### [Acknowledgements]

This work was carried out with the support of “Cooperative Research Program for Agriculture Science & Technology Development (PJ011365012018)” Rural Development Administration, Republic of Korea.

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