

Antioxidant Activities in Germinated and Non-germinated Seeds of Sharei-rice Germplasm

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[Introduction]

“Sharei” is a proper name calling for the weedy rice that is native to Ganghwa Island in South Korea. As weedy rice is more adaptable to environment than the cultivated rice, it is expected that the weedy rice seeds might contain more useful substances for nutritional and medicinal purposes. Therefore, the aims of this study are to screen the germplasm for high antioxidant activities in germination and non-germination conditions, and to select an accession of Sharei-rice showing the highest antioxidant activity, which will be used as a potentially functional substance material in further research.

[Materials and Methods]

The 199 accessions of Sharei-rice were used in the experiment with a check variety (Sindongjin). The 19 accessions were firstly selected by DPPH radical scavenging activity test. The selected accessions were rescreened by the antioxidant activities of germinated and non-germinated seeds measured through the four assays (DPPH, ABTS, reducing power activity (RPA) and total phenol (TP) determination).

[Results and Discussions]

In the first screening, the DPPH radical scavenging activities were varied in the range from 31 to 91.7% and average was 82.5%, and 19 accessions showing more than 91% of the DPPH radical scavenging activities were selected. Then, Antioxidant activities were examined in the non-germinated and germinated seeds of all weedy rice and SDJ. Brown rice (BR) of SDJ showed 68.8% (DPPH), 55.1% (ABTS), 0.3 (RPA) and 161.8 mg GAE 100g⁻¹ (TP), respectively. For the BR of all weedy rice, antioxidant activities were ranged from 90.1 to 92.8% (DPPH), 97.4 to 99.8% (ABTS), 0.6 to 1.9 (RPA) and 256.4 to 550.0 mg GAE 100g⁻¹ (TP), respectively. Germination cannot enhance and can even decrease the antioxidant activities in most cases. Exceptionally, germination enhanced TP content of WD-3 from 450.5 to 510.8 mg GAE100g⁻¹. Additionally, WD-3 showed the maximum antioxidant activities in other 3 assays. Among the tested accessions, an accession named ‘WD-3’ showed the highest antioxidant activities, suggesting that WD-3 is a promising potential antioxidant source and could be developed as a potentially functional substance materials. Therefore, WD-3 was selected for further analysis.

Keywords: Weedy rice, Sharei-rice, Antioxidant activity, Total phenol, Germination

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