

PC-030

Correlation of Total Polyphenol Contents and Antioxidant Activity in Colored Rice Accessions Collected from Different Countries

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[Introduction]

Rice is the one of major food crop and serve as important source of daily caloric intake around the world. Therefore, identification of promising traits (e.g. seed color and bioactive compounds etc.) in its gene-bank for production and breeding is very important. The colored rice has been effective in suppressing aging, protecting eyesight, and increasing anti-cancer and anti-obesity activities in body. These functions are linked with antioxidant activity. Total polyphenol contents are known as materials activating antioxidant, so this study was focused on the correlation between total polyphenol contents and antioxidant activity of colored rice.

[Materials and methods]

The colored rice accessions (648) were collected from 44 countries of 6 continents; majority of seed samples were obtained from Asian continent (557 accessions in 23 countries). The total polyphenol contents and antioxidant activity in colored rice samples extract (prepared using 80 % methanol) were measured using micro-plate reader. Total polyphenol contents were calculated using a gallic acid standards and expressed as mg GAE/g DW; while the antioxidant activity (IC₅₀; ug ml⁻¹) of samples were determined using the method of the DPPH and ABTS⁺ decolorization assay.

[Results and Discussion]

The polyphenol contents in colored rice ranged from 0.01 to 5.83 mg GAE/g DW. Antioxidant activity in the colored rice samples ranged from 83.76 to 1862.78 IC₅₀; ug/ml and 14.67 to 1303.00 IC₅₀; ug/ml. The relationship among antioxidant activity (DPPH, ABTS⁺) and total polyphenol contents was significant. In this comparative study among assay methods, the correlation coefficient between the DPPH radical scavenging activity and the ABTS radical activity was significant at p<0.01 (r= 0.186). Total polyphenol content was negatively correlated with DPPH and ABTS⁺ corresponding to r= -0.146, r= -0.141 (p<0.01) respectively. DPPH and ABTS⁺ was measured as IC₅₀; the colored rice having lower IC₅₀ possessed high antioxidant activity due to high poly phenol contents, which explains the inverse relationship between total polyphenol contents and DPPH or ABTS⁺. In conclusion, the total polyphenol contents and antioxidant activity in colored rice accessions collected from different ecological regions were significantly correlated. Among all the tested rice accession, Kagawadangomochi (Local variety, JPN) was the best accession, belonging top 10 % of total polyphenol contents, DPPH and ABTS⁺.

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