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Correlation of Total Flavonoid Contents and Total Polyphenol Contents 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 is very important for production and breeding purposes. Especially, the colored rice has better germinability and resistance to biotic and abiotic stresses. In humans, colored rice consumption proved helpful in suppressing aging, eyesight protection with escalated anti-cancer and anti-obesity activities and these functions are associated with antioxidant activity. Presence of antioxidant compounds such as polyphenols and flavonoids trigger the antioxidant activities in the plants and these compounds are abundant in the colored rice than white rice; suggesting the significance to identify rice accessions rich in these compounds. Therefore, this study was focused on the identification of correlation between total flavonoid and polyphenol contents of colored rice accessions from different ecological origins.

[Materials and methods]

The colored rice accessions (553) were collected from 44 countries of 6 continents; majority of seed samples were obtained from Asian continent (472 accessions in 23 countries). The total flavonoid contents and total polyphenol contents in colored rice samples extract (prepared using 80 % methanol) were measured using micro-plate reader at 510 nm. Total polyphenol contents were calculated using a catechin standards and expressed as mg CE/g DW; while total polyphenol contents were calculated using gallic acid standards and expressed as mg GAE/g DW.

[Results and Discussion]

The flavonoid and total polyphenol contents in the tested colored rice accessions ranged from 0.03 to 11.55 mg CE/g DW and 0.03 to 5.83 mg GAE/g DW, respectively. The relationship among total flavonoid and total polyphenol contents was significant. In this comparative study, among assay methods, the correlation coefficient between the total flavonoid and total polyphenol was significant at $p<0.01$ ($r= 0.535$). In conclusion, the total flavonoid contents and total polyphenol contents in colored rice accessions collected from different ecological regions were significantly correlated. There were only 32 accessions with high flavonoid content over 5.00 mg CE/g DW. Among all the tested rice accession, Baliatinao(Weed type, PHL) and HEI-CHIAO-CHUI-LI-HSING KENG(Breeding variety, CHN) were the best two accessions, belonging to top 20 accession of total flavonoid contents and total polyphenol contents.

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