Comparisons of Antioxidant Capacity, Phenolics, and Flavonoids in Eco-friendly Cultivated and Conventional Cultivated Rice

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Abstract: Phytochemicals are extensively found at different levels in various plants and are widely recognized for their role in scavenging free radicals, which are involved in the ecology of many chronic diseases. Secondary metabolites play an important role in plant defense mechanism, and increasing evidences indicate that many are important in human health. In this study, the levels of total phenolic content, flavonoid content and antioxidant activities based on oxygen radical absorbance capacity (ORAC) values in eco-friendly cultivated and conventional cultivated rice are conducted to compare in various extracted solvents: water, 80% acetone, 80% ethanol, and 80% methanol. The data analysis results revealed that the eco-friendly cultivated and unpolished rice were consistently found to have higher level of phenolic content, flavonoid content and ORAC values as compared to conventional cultivated and polished rice. There were positive correlation between antioxidant activity and phenolic content of rice were evident. The correlation coefficient of $R^2 = 0.96$, $R^2 = 0.93$, $R^2 = 0.97$ and $R^2 = 0.96$ with water, 80% acetone, 80% ethanol, and 80% methanol extracts, respectively were found. In addition, the correlation coefficients between flavonoid content and ORAC values of rice were also highly related with various extracts ($R^2 = 0.96-0.98$). Among the applied solvent, the water, 80% acetone and 80% ethanol were found more effective for phenolic content, flavonoid content and antioxidant measurements, respectively.

Key words: Antioxidant capacity, phenolics, flavonoids, eco-friendly cultivated rice, conventional cultivated rice.