CHANGES OF ANTIOXIDANT ACTIVITY AND BIOACTIVE COMPOUNDS DURING STORAGE OF COLORED RICE (*ORYZA SATIVA* L., CVS. HOM NIL AND HOM MALI)

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Changes of Antioxidant Activity and Bioactive Compounds During Storage of Colored Rice (*Oryza sativa* L., cvs. Hom Nil and Hom Mali)

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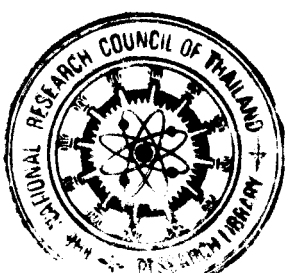

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ABSTRACT

Colored rice is being recognized as a potential source of antioxidants and bioactive compounds and displays a potent radical scavenging activity which stems from its high bioactive compounds. Changes of radical scavenging activity and bioactive compounds such as total anthocyanins, polyphenol and β-carotene contents of black (Hom Nil) and red (Hom Mali) colored rice cultivars under different storage conditions of temperature (20, 30 and 40°C), O_2 concentration (0, 5 and 10%) and relative humidity (52, 67 and 79%) stored for four-month were investigated. The sorption isotherms of black and red colored rice were also constructed in this study.

The antioxidant activity in terms of radical scavenging activity and bioactive compounds, namely, polyphenols, total anthocyanins and β-carotene contents and color measurements of the black and red colored rice cultivars are significantly different between cultivars and harvest years. Although bioactive compounds of black rice were higher than that of red rice, the red rice showed greater radical scavenging activity than that of the black rice. Storage temperature did not significantly affect the radical scavenging activity and bioactive compounds of black and red rice cultivars stored for four-month. However, radical scavenging activity and β-carotene content were gradually increased and total anthocyanins and polyphenol contents decreased as the storage time increased. Various O_2 concentrations also did not significantly affect on radical scavenging activity, total anthocyanins content and color measurements of rice samples, however, significant affects were found in increasing of β-carotene content and decreasing of polyphenol contents of the both rice samples. RH had strong influence on decreasing of β- carotene content of black rice. Increasing of radical scavenging activity and decreasing of total anthocyanins, polyphenol contents and color measurements were found during storage; however, these changes were not the affect of relative humidity in the range of 52-67% RH. The radical scavenging activity was significantly associated with polyphenol contents in colored rice cultivars. The moisture sorption isotherms of the colored rice followed the type II according to the Brunauer–Emmett–Teller (BET) classification. The GAB model is fitted for the a_w in the ranged of 0.11-0.67 for the black and red rice. The relatively low temperature (20-40°C), low O_2 concentration (0-10 % O_2) and relatively humidity (52- 67% RH) can retained the radical scavenging activity and some bioactive compounds of the colored during storage.

Keywords: Radical Scavenging Activity/ Bioactive Compounds/ Anthocyanins/ Polyphenols/ β-Carotene/ Temperature/ Oxygen Concentration/ Relative Humidity/ Storage/ Colored Rice

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This dissertation reports the original work of the author, except otherwise acknowledged. It has not been submitted previously at this or any other University.

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