Effect of Rice Varieties and Germination Time on Melatonin and Its Derivative in Rice

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Abstract:

Melatonin is a hormone in the nervous system synthesize in the pineal gland of the brain. Melatonin in human plays an important role in regulating the biological rhythm of the body, improve the sleeping quality, and exhibits antioxidant activity. Melatonin can also be found in plants, but the concentration in plant is low. Therefore, the germination as one of several processes that can increase the amount of bioactive compounds in the plants was applied to investigate the effect of germination on changes of melatonin and its derivative content in rice. Five rice cultivars (paddy rice) including jasmine rice, waxy rice, red rice, purple waxy rice and riceberry rice were used. Rice samples were soaked for 24 h and then germinated in room temperature for four days. The germinated rice of each cultivar was sampled and took out every day. The samples were dried and milled to obtain brown rice prior to grinding to fine particle before analysis for melatonin and derivatives. The results showed that rice cultivars and germination time affected the content of melatonin in jasmine rice and riceberry rice while serotonin and tryptophan were significantly increased during germination. The highest melatonin content was found in red rice (3.52 µg/g). The serotonin and tryptophan contents were 0.082 µg/g and 0.449 µg/g found in riceberry and purple waxy rice respectively. For the study on effect of germination time, the highest amount of melatonin was significantly increase after germinated for two days in all cultivars.

Keywords: Melatonin, serotonin, tryptophan, rice's germination