Effect of Different Germination Conditions on Antioxidative Properties and Bioactive Compounds of Germinated Brown Rice

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ABSTRACT

In this study, we used Taiwan Japonica 9 (TJ9) and Taichung Indica 10 (TCI10) brown rice to prepare germinated brown rice. Following were the conditions applied for inducing germination: soaking time 24, 48 or 72 h; temperature 26 or 36℃, incubation in light or dark; and an open vessel or a closed vessel. The antioxidative properties and bioactive compounds in the germinated samples were investigated. We obtained the following results: the moisture content of TJ9 and TCI10 samples after 24 h of soaking at 36℃, in the dark and in a closed vessel was 33.04% and 32.91%, respectively. The DPPH radical scavenging activity of TCI10 germinated at 36℃ after 72 h of soaking in a closed vessel in light was the highest at 84.67%, while that of ungerminated brown rice was 48.06%. The reducing power of TJ9 germinated at 26℃ after soaking for 24h in a closed vessel in light was the highest at 1.06, while that of ungerminated brown rice was 0.92. The trolox equivalent antioxidant capacity (TEAC) of TJ9 germinated at 36℃ after soaking for 72h in the dark and in an open vessel was the highest at 4.81 mM, while that of the ungerminated brown rice was 1.23 mM. The GABA contents of TJ9 and TCI10 germinated at 36℃ for 72h in the dark and in a closed vessel was the highest at 42.91 and 44.11 mg/100g, respectively, whereas the corresponding content for the ungerminated brown rice samples were 0.19 and 0.85 mg/100g. The γ-oryzanol content of the TJ9 sample was the highest on germination at 36℃ for 72 h in the dark and in a closed vessel (cycloartenyl ferulate, 174.32 mg/100g; 24-methylene cycloartanylferulate, 156.92 mg/100g; campesteryl ferulate, 346.40 mg/100g; sitosteryl ferulate, 761.87 mg/100g), while the corresponding values for the ungerminated brown rice were 158.12, 146.14, 313.15 and 749.56 mg/100g. The tocopherol content of TJ9 germinated at 36℃ for 72h in the dark and in a closed vessel was the highest 1.19 mg/100g, while the corresponding value of ungerminated brown rice was 0.28 mg/100g. The tocotrienol content of TJ9 germinated at 36℃ for 72h in the dark and in a closed vessel was the highest at 0.73 mg/100g, while that of the ungerminated brown rice was 0.42 mg/100g.

Keywords : Germinated brown rice、Germination condition、Antioxidative properties、Bioactive compounds

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