

Quantitative Analysis of the High-Value Bioactive Components of Pre-Germinated and Germinated Pigmented Rice (*Oryza sativa* L. Cv. Superjami and Superhongmi)

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Abstract : Being the world's most consumed grain crop, rice (*Oryza sativa* L.) demands' have increase and this prompted the development of new rice cultivars with high bio-functional properties than the commonly used white rice. Ordinary rice variety is already known to be a potential source for a number of nutritional as well as bioactive compounds. To further enhance the rice's nutritive values, germination is done in addition to making it more tasty and palatable when cooked. Pigmented rice, on the other hand, has become increasingly popular in the recent years for their greater antioxidant potential and other nutraceutical properties which can help alleviate the occurrence of the increasing incidence of metabolic diseases. Combining these two (2) parameters, this research study is sought to quantitatively determine the pre-germinated and germinated quantities of the major bioactive compounds of South Korea's newly developed purplish pigmented rice grain cultivar Superjami (SJ) and red pigmented rice grain Superhongmi (SH) and compare them against the non-pigmented Normal Brown (NB) rice variety. Powdered rice grain cultivars were subjected to 72-hour germination period and the quantities of GABA, γ -oryzanol, ferulic acid, tocopherol and tocotrienol homologues were compared against their pre-germinated condition using γ -amino butyric acid (GABA) analysis and High Performance Liquid Chromatography (HPLC). Results revealed the effectiveness of germination in enhancing the bioactive components in all rice samples. GABA contents in germinated rice cultivars increased by more than 10-fold following the order: SJ > SH > NB. In addition, purple rice variety (SJ) has higher total γ -oryzanol and ferulic acid contents which increased by > 2-fold after germination followed by the red cultivar SH then the control, NB. Germinated varieties also possess higher total tocotrienol content than their pre-germinated state. As for the total tocopherol content, SJ has higher quantity, but the red-pigmented SH (0.16 mg/kg) is shown to have lower total tocopherol content than the control rice NB (0.86 mg/kg). However, all tocopherol and tocotrienol homologues were present only in small amounts (< 3.0 mg/kg) in all pre-germinated and germinated samples. In general, all of the analyzed pigmented rice cultivars were found to possess higher bioactive compounds than the control NB rice variety. Also, regardless of their strain, germinated rice samples have higher bioactive compounds than their pre-germinated counterparts. This only shows the effectiveness of germinating rice in enhancing bioactive constituents. Overall, these results suggest the potential of the pigmented rice varieties as natural source of nutraceuticals in bio-functional food development.

Keywords : bioactive compounds, germinated rice, superhongmi, superjami

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