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Quantitative and qualitative analysis of flavonoids in yellow grain mutant (*Oryza sativa* L.)

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Flavonoids are widely distributed group of plant phenolic compounds which are potential source of active natural health-promoting compounds. Although anthocyanins and phenolic acids have been extensively studied in colored rice, few studies have focused on flavonoids and reported. Here, we report for the first time the yellow grain mutant containing an excessively high quantity of flavonoids. Identification and quantitative analysis of flavonoids in yellow grain mutant were carried out by UPLC-ESI-Q-TOF-MS. A total of 19 flavonoids were tentatively identified by comparing retention times and accurate mass measurement. Among them, six major flavonoids including isoorientin, isoorientin 2"-O-glucoside, vitexin 2"-O-glucoside, isovitexin, isoscoparin 2"-O-glucoside, and isoscoparin were further quantified as main compounds in quantitative analysis, in whole grain, endosperm, and embryo of the yellow grain mutant, respectively. High level of six major flavonoids accumulation was observed in both embryo and endosperm of yellow grain mutant than those of wild type. In particular, content of isoorientin was exceptionally high in the embryo of yellow grain mutant. In addition, significant differences ($p < 0.001$) in total phenolic compounds and antioxidant activities which determined by DPPH, FRAP, and TEAC assay, were found in embryo and endosperm of yellow grain mutant. These results suggest that six flavonoids including isoorientin may play an important role in the coloration and antioxidant activities of the embryo and endosperm of yellow grain mutant, respectively. These flavonoids may be useful for understanding flavonoids biosynthesis in rice and this study will contribute to improving the functional quality of rice grain.

Biography

Gileung Lee present work in crop molecular breeding lab, Seoul National University, South Korea

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