

Quantification of Vitamin E and γ -Oryzanol Components in Rice Germ and Bran

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Abstract

Rice bran is a rich natural source of vitamin E and γ -oryzanol, which have been extensively studied and reported to possess important health-promoting properties. However, commercial rice bran is a mixture of rice bran and germ, and profiles of vitamin E and γ -oryzanol components in these two different materials are less well-studied. In the current study, vitamin E and γ -oryzanol components in rice bran and germ were analyzed by liquid chromatography/mass spectrometry/mass spectrometry. The components were identified by electrospray ionization mass spectrometry (ESI-MS) with both positive- and negative-ion modes. Both deprotonated molecular ion $[M - H]^-$ and protonated molecular ion $[M + H]^+$ found as the base peaks in spectra of vitamin E components made ESI-MS a valuable analytic method in detecting vitamin E compounds, especially when they were at very low levels in samples. Ultraviolet absorption was used for quantification of vitamin E and γ -oryzanol components. While the level of vitamin E in rice germ was 5 times greater than in rice bran, the level of γ -oryzanol in rice germ was 5 times lower than in rice bran. Also, the major vitamin E component was α -tocopherol in rice germ and γ -tocotrienol in rice bran. These data suggest that rice bran and germ have significantly different profiles of vitamin E and γ -oryzanol components. The method enables rapid and direct on-line identification and quantification of the vitamin E and γ -oryzanol components in rice bran and germ.

Keywords: Rice bran; rice germ; γ -oryzanol; vitamin E; LC-MS/MS