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

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DOI: 10.1021/jf071957p
Publication Date (Web): August 11, 2007
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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