Gamma-oryzanol rich fraction regulates the expression of antioxidant and oxidative stress related genes in stressed rat's liver.

ABSTRACT

Background. Gamma-oryzanol (OR), a phytosteryl ferulate mixture extracted from rice bran oil, has a wide spectrum of biological activities in particular, it has antioxidant properties. Methods. The regulatory effect of gamma-oryzanol rich fraction (ORF) extracted and fractionated from rice bran using supercritical fluid extraction (SFE) in comparison with commercially available OR on 14 antioxidant and oxidative stress related genes was determined in rat liver. Rats were subjected to a swimming exercise program for 10 weeks to induce stress and were further treated with either ORF at 125, 250 and 500 mg/kg or OR at 100 mg/kg in emulsion forms for the last 5 weeks of the swimming program being carried out. The GenomeLab Genetic Analysis System (GeXPS) was used to study the multiplex gene expression of the selected genes. Results. Upon comparison of RNA expression levels between the stressed and untreated group (PC) and the unstressed and untreated group (NC), seven genes were found to be down-regulated, while seven genes were up-regulated in PC group compared to NC group. Further treatment of stressed rats with ORF at different doses and OR resulted in up-regulation of 10 genes and down regulation of four genes compared to the PC group. Conclusions. Gamma-oryzanol rich fraction showed potential antioxidant activity greater than OR in the regulation of antioxidants and oxidative stress gene markers.

Keyword: Gamma-oryzanol (OR); Gamma-oryzanol rich fraction; Antioxidant; Gene expression; Oxidative stress gene; Rat.