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# UV-B mediates isoflavone accumulation and oxidative-antioxidant system responses in germinating soybean

Meng Ma, Pei Wang, Runqiang Yang, Ting Zhou and Zhenxin Gu\*

College of Food Science and Technology, Nanjing Agricultural University, Nanjing, Jiangsu 210095,  
People's Republic of China

\* Corresponding Author

Tel /fax: +86-25-84396293;

E-mail: guzx@njau.edu.cn

## Abstract

This study investigated the relationships among UV-B radiation dose, isoflavone monomers and the oxidative-antioxidant system in germinating soybean. Results showed that the isoflavone monomers content showed a good fit to the quadratic model with UV-B radiation dose, except for aglycones. UV-B decreased phenylalanine content and up-regulated the key enzymes activities in isoflavone biosynthesis.  $H_2O_2$ , electrolyte leakage, malondialdehyde,  $T_{22}$  and  $M_{22}$  were increased, while  $T_{23}$  and  $M_{23}$  decreased. Microscopic analysis showed excess UV-B radiation resulted in the reduced cell volume, irregular cell shape, and increased cell space. The antioxidant enzymes activities were enhanced by UV-B. These results demonstrated that UV-B could trigger the formation of  $H_2O_2$ , resulting in the oxidative stress. Thus, the antioxidant system, including the enzymatic (enhanced the antioxidant enzymes activities) and nonenzymatic (accumulated isoflavones) were activated to minimize oxidative damage. This study provides theoretical basis for enhancing isoflavone monomer accumulation in plant-source foods by UV-B.

## Keywords

UV-B, isoflavone accumulation, antioxidant, germinating soybean, LF-NMR

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