

**Characterization of the Free Radical-Scavenging Activities of DDMP Saponins**

Soo Jin Cho\*, Hee Jun Baik, Ji Hee Ha<sup>1</sup>, Chang Ho Lee<sup>1</sup>, Ill Min Chung<sup>2</sup>, Sang Sun Lee  
Department of Food and Nutrition, Hanyang University, Department of Pharmacology,  
Hanyang University<sup>1</sup>, Department of Crop Science, Kunkuk University<sup>2</sup>

Oxygen free radicals are highly reactive molecules with unpaired electrons, e.g.,  $O_2^{\cdot -}$ ,  $H_2O_2$ ,  $OH^{\cdot}$ ,  $ROO^{\cdot}$ ,  $RO^{\cdot}$ . Free radical-mediated oxidative stress has been implicated in the development and exacerbation of several degenerative diseases. Lately a number of researches have been done on phytochemicals including a variety of antioxidant materials from many plant sources. Soybean saponin is one of the several physiologically active soybean glycosides. Recently new soybean saponins with DDMP (2,5-dihydroxy-6-methyl-2,3-dihydro-4H-pyran-4-one) moiety have been isolated from legumes. The purpose of this study is to characterize free radical scavenging activities on  $OH^{\cdot}$  and  $O_2^{\cdot -}$  of DDMP saponins ( $\alpha$  g,  $\beta$  g saponin) isolated from *Glycine max* (L.) Merrill. In order to investigate the scavenging activity on  $OH^{\cdot}$ , rat liver homogenate was incubated for 20 minutes at 37°C in the presence of  $FeCl_3$  with or without DDMP saponin, and lipid peroxidation was determined by measuring the thiobarbituric acid-lipid peroxide complex formation. In addition, scavenging activity on the superoxide radical generated with xanthine-xanthine oxidase system was measured and the percent inhibitory effects on superoxide formation was calculated. Results are as follows; upto 0.25 mg DDMP saponins ( $\alpha$  g and  $\beta$  g saponins) did not cause any significant effects on the prevention of lipid peroxidation as compared with control. In terms of superoxide scavenging activities, 0.25 and 0.5mg  $\alpha$  g saponin inhibit only 2.6% and 5.5% of control, respectively. However,  $\beta$  g saponin dose-dependently inhibits the formation of superoxide radical upto 21.3% of control with maximal dose of 0.5mg ( $p < 0.05$ ). In conclusion, soybean DDMP saponins seem to have no scavenging effects on  $OH^{\cdot}$  free radical, but they show some superoxide radical scavenging activities which is equivalent to 0.17 units of superoxide dismutase activity.