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Antioxidative effects of white and red ginsengs against H_2O_2-induced oxidative stress in skeletal muscle cells

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실험목적 (Objectives)

The aim of this study was to determine preventive effects of Korean white ginseng and red ginseng on H_2O_2-induced oxidative stress in L6 myotubes.

재료 및 방법 (Materials and Methods)

The roots of ginseng were extracted with 70% methanol and partitioned with butanol to obtain saponin fractions, which have been known as bioactive constituents of ginseng. Malondialdehyde (MDA) content and 2′,7′-dichlorofluorescein diacetate (DCF-DA) assay was measured for evaluating intracellular reactive oxygen species (ROS) generation. Also, mRNA expressions and activities of intracellular antioxidant enzymes were evaluated after treatment of saponin or non-saponin fractions of ginseng in H_2O_2-treated L6 mytotubes.

실험결과 (Results)

According to DCF-DA assay, ROS generation was significantly increased more than 2.8-fold in H_2O_2-treated L6 myotubes. In contrast, saponin fractions fo ginsng extracts effectively reduced ROS production to almost control level. Treatment of ginseng definitely attenuated MDA production by increasing lipid peroxidation in H_2O_2-treated L6 myotubes. In addition, *Panax ginseng* increased effectively intracellular antioxidant enzyme activities including catalase, glutathione peroxidase (GPx) and superoxide dismutase (SOD) in L6 myotubes. Interestingly, antioxidative effect of red ginseng showed more potent than those of white ginseng. These results indicate that administration of *Panax ginseng* may certainly contribute to prevent from damaging skeletal muscle cells by oxidative stress.

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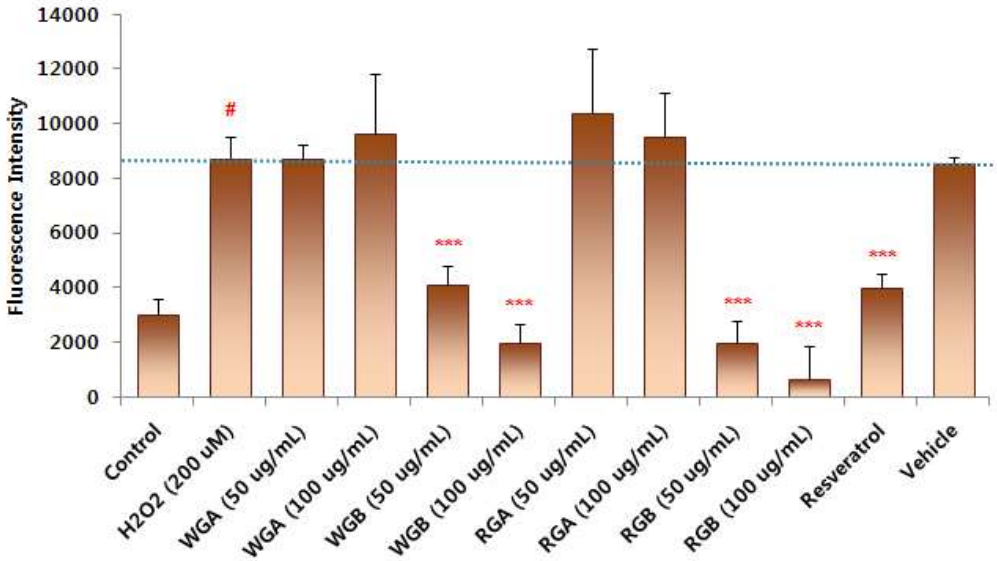

Fig. 1. Reactive oxygen species (ROS) generation by treatment with ginseng extracts in H_2O_2 -treated L6 myotubes.

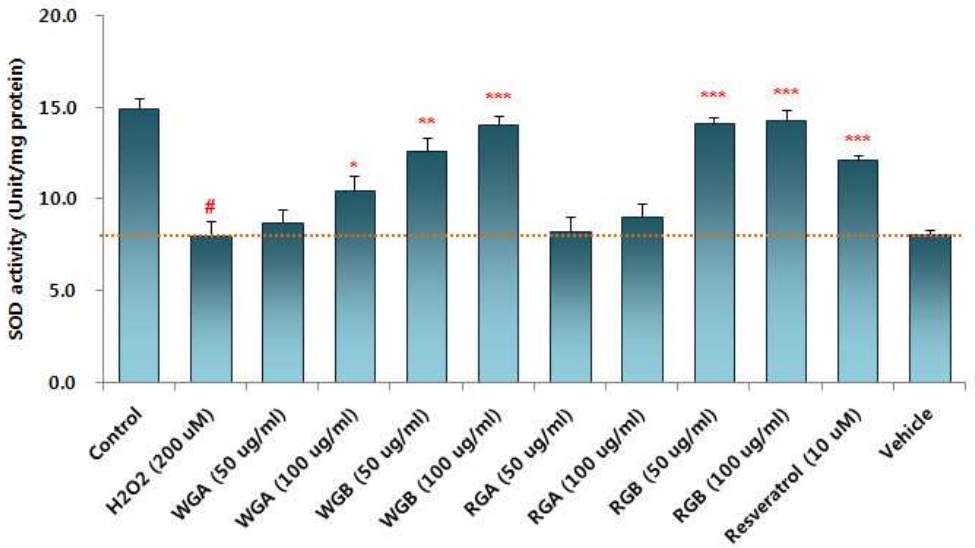

Fig. 2. Effect of white and red ginsengs on SOD activity in H_2O_2 -treated L6 myotubes.

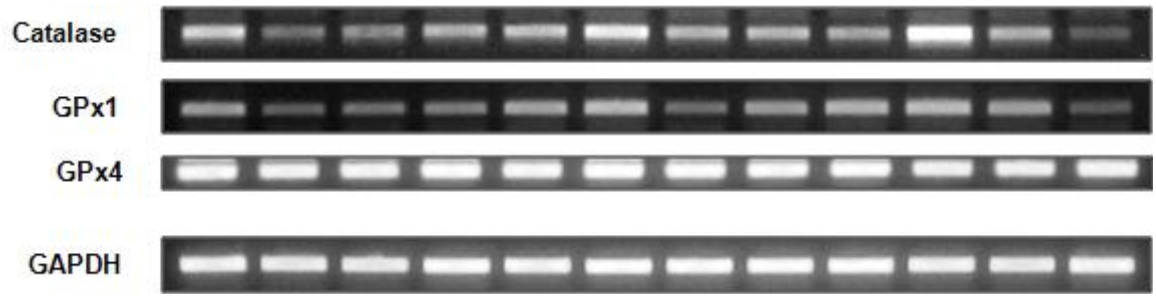

Fig. 3. Effects of white and red ginsengs on mRNA levels of catalase, GPx1 and GPx4 in H_2O_2 -treated L6 myotubes.