

Modification of Radiation Response in Mice by *Panax ginseng* and Diethyldithiocarbamate

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We performed this study to determine the effect of *Panax ginseng* and its fractions on jejunal crypt survival, endogenous spleen colony formation, and apoptosis in jejunal crypt cells of mice irradiated with high and low dose of γ -irradiation. The radioprotective effect of ginseng was compared with the effect of diethyldithiocarbamate (DDC). Ginseng administration before irradiation protected the jejunal crypts ($p < 0.005$), increased the formation of endogenous spleen colony ($p < 0.005$) and reduced the frequency of radiation-induced apoptosis ($p < 0.05$). The radioprotective effect on jejunal crypts and apoptosis in the DDC treated group appeared similar to that in the ginseng treated groups. Treatment with DDC showed no significant modifying effects on the formation of endogenous spleen colony. In the experiment on the effect of fractions of ginseng, the result indicated that the lipophilic non-polar compounds (Fraction 1), lipophilic-acidic compounds (Fraction 2), free sugars (Fraction 7) and saponin compounds (Fraction 8) might have a major radioprotective effect. Although the mechanisms of this inhibitory effect remain to be elucidated, these results indicated that ginseng might be a useful radioprotector, especially since it is a relatively nontoxic natural product. Further studies are needed to characterize better the protective nature of ginseng extract and its components.