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EXPERIMENTAL AND EPIDEMIOLOGICAL EVIDENCE FOR NON-ORGAN SPECIFIC CANCER PREVENTIVE EFFECT OF KOREAN GINSENG AND IDENTIFICATION OF ACTIVE COMPOUNDS

Taik-Koo Yun

Laboratory of Experimental Pathology, Korea Cancer Center Hospital, Seoul, 139-240, Korea
E-mail: tkyun@nuri.net

Panax ginseng C. A. Meyer has been the most highly recognized medicinal herb in the Orient. The prolonged administration of red ginseng extract significantly inhibited the incidence of hepatoma and also proliferation of pulmonary tumors induced by aflatoxin B₁ and urethane. Statistically significant anticarcinogenic effects were observed in powders and extract of 6 year-dried fresh ginseng, 5 and 6 year-white ginseng and 4, 5 and 6 year-red ginseng by 9 week medium-term anticarcinogenicity test using benzo[a]pyrene (Yun's model). The anticarcinogenicity of ginseng was more prominent in aged or heat treated extracts of ginseng and red ginseng made by steaming. In case-control studies, odds ratios (OR) of the cancer of lip, oral cavity and pharynx, larynx, lung, esophagus, stomach, liver, pancreas, ovary, and colorectum were significantly reduced. On the type of ginseng, the ORs for cancer were reduced in fresh ginseng extract intakers, white ginseng extract intakers, white ginseng powder intakers, and red ginseng intakers. In a cohort study with 5 years follow-up conducted in ginseng cultivation area, ginseng intakers had a decreased relative risk (RR) compared with non-intakers. The relative risks (RRs) of ginseng intakers were decreased in gastric cancer and lung cancer. These findings strongly suggest that *Panax ginseng* C.A. Meyer cultivated in Korea is non-organ specific cancer preventive effects against various cancers. To investigate the active components for cancer prevention, several fractions of fresh and red ginseng, four semi-synthetic ginsenosides (Rh₁, Rh₂, Rg₃ and Rg₅), major saponin components in red ginseng, were prepared. Among the ginsenosides, Rg₃ and Rg₅ caused statistically significant reduction of lung tumor incidence

and Rh₂ had a tendency of decreasing the incidence in the Yun's model.

In conclusion, these results strongly suggest that *Panax ginseng* C.A. Meyer cultivated in Korea is non-organ specific cancer preventive against human cancers and also indicate that the anticarcinogenicity or human cancer preventive effect of *Panax ginseng* is due to ginsenoside Rg₃, Rg₅ and Rh₂.

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