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### Chemopreventive effects of ginger

**Nirmala Kota**

National Institute of Nutrition, India

Ginger is considered to be one of the most important nutraceutical plant and it contains bioactive substances like gingerols, shogaols and paradols that exhibit antioxidant, antimutagenic, antigenotoxic and anticarcinogenic properties. This article provides an insight on the studies regarding cancer preventive potential of ginger. An *in vivo* experiment was conducted to study the effect of ginger feeding on drug metabolizing enzymes in rats. Stimulatory effect due to ginger feeding was observed in tissues on GST, QR activity and antioxidant enzymes. Inhibition in the formation of malondialdehydes and reduction in the protein oxidative products in liver and kidney further supported its antioxidative potential. In continuation, a study was undertaken to see the effect of ginger under induced oxidative stress in streptozotocin induced diabetic rats. Dose-response increase in the activity of SOD, Catalase and GSHPx was observed. Dose-related effect was seen in the inhibition of MDA levels in liver in both non-diabetic and diabetic groups compared to control group. Reduction in the carbonyl levels was also observed in both the groups compared to control and a dose-response relation was seen. The DNA damage in blood of diabetic rats fed with ginger decreased showing a dose-dependent inhibitory action on DNA damage. Cytogenetic damage is considered to be one of the biomarker of genotoxicity. Peripheral blood lymphocytes were obtained from smokers, non-smokers and females. Trans stilbene oxide (TSO) was used to induce genetic damage in blood lymphocytes. Micronucleus expression was investigated in cytokinesis-blocked human lymphocytes following *in vitro* exposure to TSO which induced significant number of micronuclei. Treatment of cultured cells with ginger extract significantly inhibited the formation of micronuclei. Genotoxicants induce mutations resulting in DNA damage. In a similar study using comet assay as a tool the antigenotoxic potential of ginger. B(a)P an ubiquitously present carcinogen was used to induce DNA damage that was quantitated in terms of comet ratios. A significant reduction in comet ratios was seen in the cells treated with carcinogen along with ginger extract. Enhancing the sustainable use and conservation of indigenous knowledge of useful and medicinal plants like ginger may benefit and improve the living standard of particularly the rural population.

### Biography

Nirmala Kota, PhD in Nutrition from Osmania University, Hyderabad, India with over thirty years experience in research and academics. Currently working as a Scientist in National Institute of Nutrition on projects related to Genotoxicity, Nutrition and Cancer.

[nirmala.nin@gmail.com](mailto:nirmala.nin@gmail.com)