SUMMARY

The present study was carried out to elucidate the anti-genotoxic, chemothepapeutic and anticancer potential of the ethanolic extract of *Emblica officinalis* (Indian Gooseberry)

- The anti-genotoxic potential of the extract was studied using 7,12-dimethylbenz(a)anthracene (DMBA) as the genotoxin and Swiss albino mice as the animal model. The results of the study show that the extract has reduced the number of micronucleated polychromatic erythrocytes (MnPCEs) induced by DMBA in bone marrow and has also enhanced the antioxidant and detoxification systems of the animal.

- The chemothepapeutic potential of the extract was studied against DMBA induced hamster buccal pouch carcinoma as the experimental system. The results show that the extract reduced the tumor incidence in the animals which could have exerted its therapeutic role through the following mechanisms.

a. By improving the overall antioxidant status of the animals.

b. By resting the tumor marker enzymes to near normal levels.

c. By inhibiting the activation of the carcinogen and also enhancing the detoxification of the animal.

d. By decreasing the glyco-conjugates.
e. By inhibiting cell proliferation as evident by the decrease in the levels of nucleic acids and polyamines.

f. By preventing macromolecular damages by modulating lipid peroxidation, decreasing protein damage, DNA-protein cross-links as well as reducing DNA damage.

- The anticancer potential of the extract was studied using the human oral carcinoma cell line (KB). Results of the present study revealed the following.

a. Inhibited cell proliferation as evident from the MTT assay

b. Lipid peroxidation and marker enzymes whereas antioxidant enzymes were found to significantly increased.

c. Induced apoptosis as evident by propidium iodide staining, DNA fragmentation flow cytometry analysis, caspase 3 induction and bcl-2 activity inhibition.

The anti-genotoxic, chemotherapeutic and anti-cancer activities of the ethanolic extract of *Emblica officinalis* displayed in the present study could be due to the rich polyphenolic and tannoid composition of the fruit. Further studies on this extract are in progress in identifying the active principle and its anticancer potential against various experimental models. Successful research work on these lines would be helpful in the development of a potent anticancer drug with least side effects.