AIM AND SCOPE OF THE PRESENT WORK

The present work was undertaken with the following few broad objectives:

A. Teratogenicity Aspects

a) To study the overall teratogenic or embryotoxic effects of betel nuts of two different varieties and also of two major alkaloids of betel nuts, viz. arecoline and arecaidine.

b) To study the *in vivo* biosynthesis of DNA and protein by mouse embryos following exposure to the embryotoxic dose of arecoline which is the main active principle present in the betel nuts and acts as a monofunctional alkylating agent. This was done with a desire to observe whether any correlation exists between possible embryotoxic effects in terms of growth retardation or cell death and the macromolecular syntheses due to arecoline treatment.

c) To explore the mechanism of probable DNA damage due to the action of arecoline on the embryos by estimating the alkylation at different sites of purine bases of DNA isolated from the embryonic tissue.
B. Carcinogenicity aspects

a) To assess and evaluate the carcinogenic potential of betel nuts by studying the effects of long-term and short-term exposures respectively on the induction of direct neoplasms as well as rapid promotion of pre-neoplastic lesions, measured indirectly by a marker enzyme, \( \gamma \)-Glutamylyltranspeptidase.

b) To study the carcinogenic potential of arecoline, a major alkaloid of betel nuts by means of a few in vivo genotoxicity tests, keeping 'mutation' as end point.

The results of all these studies will not only be useful in predicting the probable teratogenic risk for the pregnant women from the betel nuts, so habitually and popularly taken with the betel quid throughout a large portion of the globe, but also in determining the carcinogenic responses that may be initiated or promoted within the human systems due to the cumulative effects of betel nut chewing for years together.