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In the present investigation an attempt was made to make an interdisciplinary approach by using various methodologies to examine and demonstrate if different potencies of homeopathic drugs (Chelidonium mother tincture, Chelidonium-30 and 200 and Carcinosin-200), singly and in combination with vitamin C, could effectively modify visible/quantifiable changes with regard to some scientifically accepted protocols in mice subjected to some chemical carcinogens (p-DAB as initiator and phenobarbital as promoter) or if Arnica montana 30 had any such protective effects on mice subjected to ultrasonication.

The thesis has been divided into two chapters of which chapter 1 includes major works involving various methodologies and endpoints in studying various aspects of azo-dye induced hepatocarcinogenesis in mice. Detailed studies using six fixation intervals, namely, 7, 15, 30, 60, 90, and 120 days of treatment have been carried out in fourteen different series of control and treated mice. The different series included: 1 Normal control series (negative control), 2 Phenobarbital series (PB), 3. Only p-Dimethylaminoazobenzene series (p-DAB fed mice mentioned as D, in tables and histograms), 4. D+PB fed series, 5. D+PB+Chelidonium Mother tincture fed series, 6. D+PB+Chelidonium-200 fed series, 7 D+PB+Chelidonium-30 fed series, 8 D+PB+Chelidonium-200+Carcinosin-200) fed series, 9. D+PB+Carcinosin-200 fed series, 10. D+PB+Alcohol fed series (positive control for homeopathic drugs), 11. D+PB+Vitamin C fed series, 12. D+PB+VC+Chelli-200 fed series, 13. D+PB+VC+CAR-200 fed series and 14. D+PB+Alc+VC fed series.

In all these series of experimental and controlled mice, cytogenetical assay by utilizing chromosomal aberrations, micronucleated erythrocytes, mitotic indices and sperm head anomaly and biochemical assays of some tumor marker enzymes like lipid peroxidase, glutamate oxaloactetate transaminase, glutamate pyruvate transaminase, acid and alkaline phosphatases and gel electrophoretic total protein profiles have been critically studied and analysed by statistical means at all fixation intervals.

Additionally, the results of some preliminary and pilot studies have also been incorporated in a smaller number of experimental and control series. This includes histological and ultrastructural studies of liver in mice conducted at 60 and 120 days' fixation intervals using common histological methods, and specific methods for scanning and transmission electron microscopies.
Further the expression of tumor suppressor gene p53 and an apoptotic protein Bax protein belonging to bcl 2 family have been studied in mice fed with D+PB, D+PB+CAR-200, D+PB+CHELI-200 and D+PB+CHELI-200+CAR-200 vis-a-vis mice fed normal diet (normal negative control) at 60 days fixation intervals. The results of all these studies including cytogenetical, biochemical, histological and ultra-structural clearly showed that all the potencies of the homeopathic drug Chelidonium either fed singly or Chelidonium 200 fed in combination with Carcinosin-200, to p-DAB+PB fed mice had antitumor and general tissue protective activities. The enzymes were favorably modulated as also the cytogenetical damages. Vitamin C fed singly to p-DAB+PB fed mice also produced effects more or less similar to the homeopathic drug Chelidonium although at a lesser scale. However, the conjoint treatment of two homeopathic drugs Chelidonium-200 and Carcinosin-200 apparently showed slight improvement than that of the mice fed with either of the homeopathic drugs alone. On the other hand feeding of Carcinosin-200 alone to p-DAB+PB fed mice apparently showed less protective effects than that shown by feeding of the different potencies of Chelidonium alone. Similarly when vitamin C was fed with Chelidonium-200 there was not any striking improvement on their protective abilities when either of these was fed alone along with p-DAB+PB. However, the feeding of VC with Carcinosin-200 apparently showed decreased protective abilities as compared to when they were fed alone to p-DAB+PB fed mice.

The second chapter includes studies on the effects of ultrasonic sound waves in mice and their alterations by the oral administration of a homeopathic drug Arnica montana-30. The effect was studied in two groups of mice, one receiving single exposure and other receiving chronic exposure to ultrasonication, using suitable controls. Only cytogenetical assay involving chromosomal aberration, micronucleated erythrocytes and sperm head anomaly has been made in this section. Arnica montana clearly showed evidence of favorably modulating cytogenetical damages produced by ultrasonication. All these data were critically analyzed with statistical calculations of the standard errors and levels of significance's. The multidisciplinary approach was indicative of providing convincing scientific evidences of the efficacy of some potentized forms of homeopathic drugs in modulating detrimental cytogenetic and biochemical effects produced during azo dye induced hepatocarcinogenesis and after ultrasonication in mice.

Relevant literatures have been cited and the novelty and significances of the works in understanding possible molecular mechanism(s) of homeopathic drugs have been discussed. The experimental data in the present investigation indicated that one major way through which the potentized homeopathic drugs could act was by regulation of expression of certain relevant genes. Various circumstantial evidences in support of this hypothesis have been pointed out and discussed.