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Study on the changes in glycolipid levels during alcoholism and paracetamol toxicity in rats

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Abstract

The changes in the levels of various glycolipid fractions during alcoholism and paracetamol toxicity were studied in rats. Rats were given different doses (1.195 g/kg body wt., 3.55 g/kg body wt. and 7.11 g/ kg body wt.) of ethanol for three months. A single oral dose of paracetamol (400 mg/kg) was given to one set of alcoholic rats and to one set of normal rats. Liver injury was assessed biochemically by measuring the activities of glutamate-oxaloacetate transaminase (GOT) and glutamate-pyruvate transaminase (GPT) in serum that were found to be increased in the different doses of alcohol treated rats and in the paracetamol administered normal and alcoholic rats. The ethanol administration in different doses and the paracetamol treatment to rats resulted in the increase of neutral glycosphingolipids, glycoglycerolipids, sulfatoglyco-sphingolipids and ganglioside levels in the liver and brain. The increased concentration of neutral glycosphingolipids especially cerebrosides may cause abnormal changes in the spinal cord and white matter of the brain. Also the observed elevated levels of liver and brain gangliosides in the alcohol treated rats and in the paracetamol administered rats may cause alterations in the membrane structure of these tissues and various cell surface phenomena.

Key words : glycolipids, alcoholism, paracetamol, gangliosides

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In vivo effects of erythrosine on mouse chromosomes

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Abstract

The present study is an attempt to evaluate the genotoxic effect of erythrosine, a commonly used food colouring agent, on swiss albino mice. It is one of the eight permitted food colours in India. Fifty male target mice were assigned to five experimental groups viz., control, low dose, intermediate dose, high dose, intermediate reversal and control reversal. After a period of 30 days of oral administration of erythrosine the animals were sacrificed and metaphase plates were prepared. Calculation of mitotic index and scoring of chromosomal aberrations were carried out. A dose-dependent decrease in cell proliferation was significant. In all treatment groups, chromosomal aberrations like gaps, breaks and ploidy observed, were less significant. Results obtained were recorded and evaluated.

Key words: Erythrosine, mice, genotoxicity, bone marrow, mitotic index, chromosomal aberration

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Hepatoprotective activity of aqueous extract of leaves of *Feronia elephantum* Correa. against thioacetamide and allyl alcohol intoxication in rats

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Abstract

The objective of the present investigation was to study hepatoprotective activity of aqueous extract of leaves of *Feronia elephantum* Correa to reverse the alterations caused by thioacetamide and allyl alcohol hepatotoxin. Albino rats (Wistar strain) were prophylactically treated with aqueous extract at two dose levels (400mg/kg and 800mg/kg, p.o) for seven days. On day six, rats were also given a single dose of thioacetamide (100mg/kg s.c.). Biochemical estimation viz. AST and ALT, physical examination viz., liver weight and liver volume and histopathological studies of liver sections were done on 8th day. In other experiment, after seven hours of fasting, aqueous extract was administered to rats at two dose levels (400mg/kg and 800mg/kg, p.o) and one hour later they were given a single dose of allyl alcohol (1.25%, 0.4ml/kg p.o.). On 2nd day, treatment with aqueous extract was repeated. On 3rd day, changes in body weight and necrosis index of liver were recorded followed by histopathological examination. The result, indicated that physical, biochemical and histopathological changes alongwith changes in necrosis index were restored to normal by treatment with aqueous extract. Thus hepatoprotective activity of aqueous extract of leaves of *F. elephantum* (400mg/kg and 800mg/kg, p.o) was confirmed and was found to be dose-dependent with multiple mechanisms.

Keywords: *Feronia elephantum*, hepatoprotective, thioacetamide, allyl alcohol

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Efficacy and toxicity of Vanadium Nicotinate in diabetic rats

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Abstract

Vanadium compounds regulate blood glucose in Type I and II diabetes mellitus. The objective of the study was to evaluate the efficacy and toxicity of vanadium nicotinate on blood glucose in diabetic rats. Diabetic rats received either vanadium nicotinate (100 mg/kg/day, p.o. as a suspension in 7% Gum acacia solution, n=6) or only Gum acacia 7% (vehicle, n=6) for 21 days. Rats were maintained for additional 7 days without administration of vanadium nicotinate. On day 28 rats were sacrificed and hepatic as well as renal injury was examined in Haemotoxylin & Eosin stained sections under a light microscope. Blood samples were withdrawn by retro-orbital puncture method and were analyzed for glucose on 0, 7th, 14th, 21st and 28th day. Maximum reduction in blood glucose was observed on 21st day. The drug showed late onset and prolonged duration of hypoglycemic effect. No abnormality was detected in liver while focal tubular necrosis with severe cloudy changes was seen in kidney in vanadium nicotinate treated group after three week of administration of vanadium nicotinate. It is concluded that vanadium nicotinate (100 mg/kg) has significant hypoglycemic activity and long term administration resulted in nephrotoxicity.

Keywords: Vanadium nicotinate, alloxan induced diabetes, blood glucose, nephrotoxicity.

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Effect of boron or calcium alone or in combination in hydrofluorosis in cattle

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Abstract

Boron (10 mg/kg.b.wt.), calcium (100 mg/kg b.wt.) and combination of boron (10 mg/kg b.wt.) and calcium (100 mg/kg.b.wt.) were evaluated for their alleviating effect during 90 days treatment in three groups of fluorotic cattle in endemic area. The therapeutic success was evaluated on the basis of recovery from clinical signs and decrease in serum and urinary fluoride level and alkaline phosphatase activity. Treatment with boron and calcium in combination for 90 days resulted quantitative and gradual reduction of serum and urinary fluoride and alkaline phosphatase level. However, no appreciable change was recorded in clinical signs in respect to teeth abnormalities. It is concluded that the boron ,calcium in combination at higher doses may have therapeutic value for management of endemic fluorosis in cattle.

Key Words: Boron, calcium, hydrofluorosis, cattle, urine

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Toxicity of respirable ambient particulates from different locations of an urban dwelling : An *in vitro* cytotoxicity study in alveolar macrophages of rats

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Abstract

In the present study, potential of sampled respirable suspended particulate matter (RSPM) to produce in vitro cytotoxicity to rat alveolar macrophages was investigated and studied with reference to samples of different locations of collection, duration of exposure, quantum of exposure and metal contents. the samples were collected from selected points covering residential, commercial and industrial areas of an urban settling. The study indicated that the exposure to RSPM decreased the cell viability to a significant extent. the release of cytoplasmic lactate dehydrogenase (LDH) in the supematant was found significantly enhanced. Nitric oxide (NO), a pro-inflammatory response molecule, was enhanced in short exposure, where as on prolonged exposures the percentage comparison was reduced with respect to controls. We concluded that RSPM of different locations on exposure to pulmonary alveolar macrophages manifested different response, which was a sum total or individual interaction of all physical, chemical and biological components. The reaction of RSPM in the exposure environment played a key role in imparting the degree of cytotoxicity.

Keywords : Alveolar macrophages, cytotoxicity, reactive nitrogen species (nitric oxide), urban respirable particulate matters.

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Quinalphos induced oxidative stress and histoarchitectural alteration in rat testis

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Abstract

The effect of quinalphos at two sublethal different doses - one at low (QP-250µg / kg b. wt.) and other at high dose (QP-500µg /kg. b .wt) for variable durations (3, 8 and 15 days respectively) on oxidative stress and testicular responsiveness as revealed by the histopathological and biochemical changes in albino adult rats, were studied. At low dose QP treatments for 3, 8 and 15 days, respectively, the changes in testicular activities in relation to testicular oxidative stress were pronounced and as a result, shrinkage of tubular diameter and testicular atrophy leading to the degenerative changes in the germinal epithelium, detrimental changes in various layers of the seminiferous tubular cells with overall significant reduction in the number of germ cell at stage VII spermatogenesis cell cycles were found. Quantitative studies of spermatogenesis revealed that a significant reduction in the number of type A spermatocytes (mPSC) and stage 7 spermatids (7Sd) at stage VII of the seminiferous epithelium cell cycles was observed at low dose QP treatment as compared with the number in corresponding vehicle (control groups) treated controls. Maximum decrease in number of 7Sd was observed from the groups treated with lower dose. Similar effects were also observed in the number of sertoli cells in the tubules after the treatment. But in the high dose treatments gradual recovery effects were noticed with significant expansion of seminiferous tubules and restoration of spermatogenesis to the control level. Similar changes in biochemical profiles such as the products of free radicals like manoldialdehyde (MDA)/lipid peroxides as well as the activities of testicular antioxidant enzymes like superoxide dismutase (SOD), catalase (CAT), Glutathione dismutase peroxide (GSH-PX), lipid and protein profiles etc. were also observed. After the treatment with low dose of quinalphos, there was an increase in the lipid peroxides or thiobarbituric acid reaction substances (TBARS)/MDA (as measured by manoldialdehyde) and a decrease in the total lipid content for the testicular membrane. Quinalphos induced oxidative stress and decreased antioxidative and antiperoxidative enzymes systems at low dose of QP resulting in the drastic changes in testicular morphology and cell architecture. On the other hand, high dose QP treatment caused lesser but gradual recovery effect. These later restoration effects may presumably be regarded as recovery effect possibly through available FSH and testosterone.

Key words: Quinalphos, testicular responsiveness, oxidative stress, histoarchitectural alteration, dose rate effects

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Effect of Photodynamic therapy on the chemically transformed tissue
of mice

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Abstract

Photodynamic effect of He-Ne laser along with the photosensitiser 5- Aminolevulinic Acid was studied in the chemically transformed tissue of mice. Skin carcinoma was induced chemically in Swiss mice by painting the carcinogen 7,12-Dimethyl Benz (a) anthracene (DMBA) and the promoter croton seed oil. The experiment was scheduled with four groups consisting of ten animals each. Group I served as control, group II received only laser, group III received only photosensitiser and group IV received laser 24 hours after the injection of photosensitising agent 5- Aminolevulinic Acid (ALA). Each tumor field was irradiated with laser energy ranging from 75 to 100 J/cm2. The results of the study indicated that the potential use of laser with ALA significantly reduced the number of papillomas compared to the control group.

Key words : Photodynamic therapy, Chemical carcinoma, Dimethyl Benzanthracene, 5-Aminolevulinic acid

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Effect of *Ocimum tenuiflorum* extracts on MDBK cell proliferation *in vitro*

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Abstract

The effect of seed and leaf extracts of *Ocimum tenuiflorum* on MDBK cell proliferation was studied *in vitro*. MDBK cells ($5x10^5$/100µl) were incubated with serial two fold dilutions of each extracts in quadruplicate well of a 96 well tissue culture plate. The plates were incubated at 37 °C in a humidified CO_2 incubator for 48 h. The effect on the cell proliferation was measured by the extent of cell toxicity caused by the measured by lactate dehydrogenase (LDH) activity in the cell culture supernatant and concomitant decrease in the cell viability as quantified by mitochondrial dehydrogenase activity by MTT reduction assay in the cell monolayer. Aqueous and alcoholic extract of dried leaves, aqueous and boiled aqueous extract of fresh leaves, decoction of fresh leaves and aqueous extract of seeds were found to cause toxicity at higher concentration as evidenced by decreased MTT reduction and increased activity of LDH in the treated cells as compared to the control cells. The MDBK cell monolayer treated with the highest concentration of the extracts for 4 at 37 °C demonstrated some cell death that was associated with decrease in cellular glutathione, decreased activities of glutathione-S-transferase and glucose-6-phosphate dehydrogenase, indicating oxidative stress. However, the lower concentration of the extracts was found to boost the cell proliferation. The factor responsible appeared to be polar and heat stable in nature. This in vitro model of toxicity testing can be used for screening cytotoxic concentrations of drugs and chemicals.

Keywords: *Ocimum tenuiflorum*, cell proliferation, cytotoxicity, MTT reduction, LDH assay