

Lipid peroxidation and some oxidative stress enzymes in aluminium acetate intoxicated albino mice

N. John Sushma¹, U. Sivaiah², N. John Suraj³, S. Kishore² and K. Jayantha Rao^{2*}

¹Departments of Biotechnology, Sri Padmavati Mahila University, Tirupati, India

²Departments of Zoology, Sri Vinkaseswara University, Tirupati, India

³Department of Neurology, UT Southwestern Medical center, Dallas, Texas, USA.

Abstract

The purpose of this study was to investigate the effect of intraperitoneally administered aluminium acetate on lipid peroxidation and some oxidative stress enzymes in different tissues like brain, liver, kidney, heart, muscle and testis of albino mice. Exposure to sublethal dose (3.5 mg/kg body weight) of aluminium acetate has revealed significant variations in the present study. Under experimental conditions, the levels of XOD increased and it is more in double and multiple dose animals. Significant change was observed in double and multiple dose administered mice. Where as in double dose aluminium acetate administered mice, the consistent elevation has been recorded. Significant increase was observed in multiple dose aluminium acetate administered mice. Such dose dependent elevation has been recorded under aluminium acetate in the present investigation.

Oestrogen induced uterine damage in rats

S. Madhuri, G. Pandey* and A. Khanna¹

Department of Pharmacology & Toxicology, College of Veterinary Science & A.H., Jabalpur- 482001, M.P., India.

¹Department of Zoology & Biotechnology, Govt. Model Science College, Jabalpur- 482001, M.P.

Abstract

The present study was undertaken to assess the oestrogen induced uterine damage in albino rats. Ethinyl oestradiol (EO) as a semisynthetic oestrogen was administered to the rats of groups 2, 3 and 4 @ 250, 500 and 750 µg/kg body weight, respectively orally once a week for 8 weeks. The same doses of EO were administered to the rats of groups 5, 6 and 7, respectively for 12 weeks. On the 9th week, vacuolar degeneration of columnar epithelial cells in the mucosa and endometrial glands was observed in rats of groups 2 to 4. The blood vessels in the endometrium were dilated and congested. In group 3, the necrosis and desquamation of epithelial cells were also evident. At certain places, proliferation of fibrovascular connective tissues was distinct in groups 3 and 4. The degeneration and necrosis of mucosa and endometrial gland with infiltration of inflammatory cells were marked in group 4. On the 13th week, these changes were more marked in the respective group. The extent and severity of uterine damage were found to be dose and time dependent, which indicated that at higher dose and prolonged period, EO (oestrogen) causes severe damage in the uterus. EO has produced the optimum and standard uterine damage at the dose of 750 µg/kg, orally weekly for 12 weeks.

Genotoxicity evaluation of human populations exposed to radio frequency radiation

P.V. Rekhadevi, N. Sailaja, M. Mahboob, M.F. Rahman and P. Grover*

Toxicology Unit, Biology Division, Indian Institute of Chemical Technology, Hyderabad - 500 007, Andhra Pradesh, India

Abstract

In the modern day life, mobile telephones have become an integral part for mutual communication. Virtually most people are exposed to radio frequency radiation. In the current study a group of 55 subjects with regular cell phone usage and an equal number of well-matched control individuals were studied. The possible genetic changes in lymphocytes of cellular telephone users were assessed with the comet assay, micronucleus test and chromosomal aberrations analysis. In addition micronucleus test on buccal epithelial cells was also carried out in the same subjects. The results suggested that in the mobile phone users there was a statistically significant increase in mean DNA damage when compared to controls. Similar result was observed with micronucleus test and chromosomal aberrations analysis also ($P < 0.05$). Age, smoking and alcohol consumption did not have any significant effect on genetic damage when analyzed by comet assay. However, no association of gender, age, smoking and alcohol consumption on micronucleus frequency was observed. Smoking and alcohol consumption had significant effect by the chromosomal aberration test ($P < 0.05$). The results of this study indicated that the genetic damage of peripheral lymphocytes and buccal epithelial cells in the mobile telephone users increased significantly, as compared with controls.

Metamitron-induced changes in biochemical profile and cytotoxicity in black Bengal goats

D. Chanda*, S.K. Das², A. Kundu², A.K. Chakraborty², T.K. Mandal², D.K. Basak³ and Suaib Luqman¹

¹Genetic Resources and Biotechnology Division, Central Institute of Medicinal and Aromatic Plants, P.O. CIMAP, Lucknow-226015, India.

²Department of Pharmacology and Toxicology and ³Department of Veterinary Pathology, West Bengal University of Animal and Fishery Sciences Mohanpur, Nadia-741252, India

Abstract

A non-toxic dose of metamitron (triazine herbicide) was determined in black Bengal goats by trial and error. Hematological parameters like total count, Hb percentage, ESR, biochemical parameters like blood sugar, pyruvic acid, LDH, AChE and tissue biochemical parameters like ALT, AST activity, reduced glutathione level and lipid peroxidation level were estimated in black Bengal goats after oral administration of a single dose of metamitron @ 30 mg/kg body weight (b.wt.). Histopathological studies were also carried out in tissue sections of liver, kidney, spleen, thyroid, heart and brain. No significant changes were found in experimental subjects when compared to control indicating that metamitron @ 30 mg/kg b.wt. may be a non-toxic dose to goats and can be used safely in agricultural field.

Effect of repeated dermal application of a-cypermethrin on lipid peroxidation and antioxidant system in rats

Rajinder Raina*, Pawan Kumar Verma, Kusum and Vinay Kant

Division of Pharmacology and Toxicology,
Sher-e-Kashmir University of Agricultural Sciences and Technology – Jammu. R. S. Pura, Jammu- 181102

Abstract

a-Cypermethrin, a pyrethroid insecticide has a wide use for crop protection and ectoparasitic control in domestic animals. Excessive dermal exposure due to environmental contamination or inadvertent use may result in hazardous effects in man and animals. In present study the various biomarkers for the oxidative stress have been studied in Wister rats. SOD and catalase activities in erythrocytes were significantly decreased after 30 day of dermal exposure although these were initially over expressed. There was significant decrease ($p < 0.05$) in blood GSH level and GPx activities in all the three groups. Enzymatic activity of GST was not significantly affected on any day of the exposure. Significant increase in lipid peroxidation of erythrocyte membrane from 10 days onwards exposure was also observed. The evaluated enzymatic and non-enzymatic components of the cell suggest that dermal exposure of a-cypermethrin produces oxidative stress in rats.

Haematological profile of subacute oral toxicity of fluoride and ameliorative efficacy of aluminium sulphate in goats

V. Kant, P.K. Verma, N.K. Pankaj, J. Kumar¹, Kusum, R. Raina* and A.K. Srivastava²

Division of Pharmacology and Toxicology, ¹Division of Veterinary Physiology,
Faculty of Veterinary Sciences and Animal Husbandry, SKUAST, R.S. Pura, Jammu, J&K

²Director, National Dairy Research Institute, Karnal, Haryana.

Abstract

High affinity of the fluoride to the bone causes intoxication of bone marrow resulting into alterations in normal hematological profile. In present study sodium fluoride alone and with aluminium sulphate (ameliorative agent) was administered orally daily for 30 days in healthy goats of group 1 and 2 respectively to assess the effect on the hematological profile on different days of exposure. Exposure of sodium fluoride alone produced significant reduction in hemoglobin (Hb), packed cell volume (PCV), total leucocytes count (TLC), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) and increase in blood clotting time. However, values of total erythrocyte count (TEC) and differential leucocytes count (DLC) were not significantly changed. On comparing the observations of ameliorative group with the group 1 goats, it is concluded that the use of the ameliorative salt $Al_2(SO_4)_3$ has beneficial effects on the alterations in values of Hb, PCV, TLC, MCV, MCH and MCHC except blood clotting time produced by the subacute exposure of sodium fluoride in goats.

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Safety / Toxicity studies of ayurvedic formulation-Navratna rasa

G.S. Lavekar¹, B. Ravishankar², S. Venugopal Rao¹, S.N. Gaidhani¹, B.K. Ashok² and V.J. Shukla²

¹Central Council for Research in Ayurveda and Siddha , Janakpuri, New Delhi-110058,

²CCRAS Pharmacological Research Unit, (G.A.U.), Jamnagar, India.

Abstract

Navratna rasa, an ayurvedic proprietary medicine based on classical formulation has been in use since long for general debility, rickets and calcium deficiency in Ayurvedic practices. The drug was screened for its safety/toxicity studies in acute and chronic models. No mortality and behavioral changes were observed during the course of acute toxicity study. The chronic toxicity study reveals that, the test drug has no serious toxicity potential to most of the important organs in therapeutics doses.

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Assessment of heavy metal contamination in the evergreen tree *Mangifera indica* L. and soils near National Highway-47 in Thiruvananthapuram District, Kerala

D.S. Jaya

Department of Environmental Sciences, University of Kerala, Kariavattom, P.O, Thiruvananthapuram, Kerala-695581

Abstract

The present study was carried out to assess the heavy metal contamination in the evergreen tree *Mangifera Indica* L. and soils near the National Highway-47 passing through Thiruvananthapuram District in Kerala State. The study showed that the concentration of heavy metals like cadmium, lead and zinc in the leaves and crops of *Mangifera indica* in the sampling stations of road sides were high compared to that of the control station in the study area. The presence of heavy metals were also detected in the soils of all selected study stations near National Highway-47, and the concentration of lead and cadmium were found high in the soils collected from the study stations, Thampanoor and Pallichal of Thiruvananthapuram district with high vehicular intensity. Therefore this study concludes that the *Mangifera indica* L and its crop 'mango' in the main road side areas of the capital city of Kerala were contaminated with heavy metals which may cause health problems in humans on daily consumption of the crop.

Purification and toxicity studies of stevioside from *Stevia rebaudiana* Bertoni

Reeja Rajab¹, C. Mohankumar^{1*}, K. Murugan², M. Harish¹ and P.V. Mohanan³

¹ Bioscience Division, SCMS Institute of Bioscience & Biotechnology Research and Development, Management House, South Kalamassery, Cochin 33, Kerala, India

²Plant Biochemistry & Molecular Biology Research Laboratory, Department of Botany, University College, Thiruvananthapuram 34, Kerala, India

³Toxicology Division, Sree Chitra Tirunal Institute For Medical Science & Technology, Biomedical Wing, Poojappura, Thiruvananthapuram 12, Kerala, India

Abstract

The present study was undertaken to purify the stevioside from leaves of *Stevia rebaudiana* and to determine its toxicity effects. The accumulation of stevioside was found in all parts of the *Stevia* plant that is from root to flowers with the highest content in mature leaves. A protocol has been standardized for the production of white stevioside powder from dried mature leaves of *Stevia rebaudiana* using water as solvent in the extraction and filtration procedures. The pigments and phenols in the crude extract were removed at the first step of processing. The depigmented extract was bleached and refined by celite treatment at the second level. The purity at each step was checked by HPLC using purified stevioside as standard. The end solution was spray dried into fine white stevioside powder. The final yield was estimated as 11.6%, which is equivalent to international standard. The protocol was found reliable and economical for the commercial production of stevioside as a natural sweetener. The method was filed for Indian patent no: 01436/CHE/2007. As a zero calorie natural sweetener with more potential application in the treatment of Type II diabetes, toxicological analysis of the product was done for revealing the acute oral toxicity and cytotoxicity of the product. In the oral toxicity test none of the animals showed any abnormal behaviour and all the organs were found physiologically normal at a higher dosage of 2000mg stevioside/kg bodyweight on feed trials suggesting the non-toxic nature of stevioside in rats. The *in vitro* cytotoxicity test has revealed the non cytotoxic property of stevioside at a concentration of 1.25g/L.

Sub-chronic (90 day) oral toxicity study in rats with lutein diacetate

D.P. Santhosh Kumar^{*1}, C. Ravikumar¹, Rajesh Eswarappa¹, H. Krishnappa¹, K.S. Rao¹, Jose Torres Quiroga² and Raviyadava²

¹Department of Safety Assessment, Advinus Therapeutics Private Limited, Post. Box No. 5813, Plot Nos. 21&22, Peenya II Phase, Bangalore – 560 058, India.

²Industrial Organics, S.A.DEC.V Are Almazan No. 100 Topo Chico, Monterrey, N.L. 64260, Mexico.

Abstract

The purpose of this study was to investigate the safety of Lutein diacetate (nutraceutical) by determining its potential toxicity following 90 days sub chronic administration in Sprague Dawley rats. The Lutein diacetate was administered orally by gavage as a suspension in corn oil at the graded doses of 2.1, 22.5 and 210 mg/kg b.wt./day for 90 consecutive days. Animals in the control recovery and high dose recovery groups were further observed for 28 days without any treatment. The changes observed were stained (light brown coloured) faeces at 210 mg/kg body weight/day dose during the 90 day treatment period and normal coloured faeces were observed during the recovery period. No treatment related effects were seen in any of the parameters monitored in rats given 2.1, 22.5 and 210 mg/kg body weight/day of Lutein diacetate. Results indicate that oral dose of Lutein diacetate is relatively safe in rats up to 210 mg/kg body weight/day.

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Oxidative stress due to ochratoxin and T-2 toxin either alone or in combination and evaluation of protective role of *Curcuma longa*, *Zingiber officinale*, toxichek and activated charcoal

M. Usha Rani, A. Gopala Reddy*, G. Dilip Reddy and M. Alpha Raji¹

Department of Pharmacology & Toxicology, College of Veterinary Science, Hyderabad-500030

¹Assistant professor, Dept. of Pharmacology & Toxicology, College of Veterinary Science, Tirupati -517 502

Abstract

A study was conducted on poultry to evaluate the oxidative stress due to ochratoxin and T-2 either alone or in combination. Broiler chicks were fed OTA @2ppm, T-2 @ 1ppm, *Zingiber officinale* (rhizome shade dried and powdered @ 0.5%, *Curcuma longa* rhizome @ 0.5%, toxichek @ 0.1% and activated charcoal @ 0.4% in feed in combinations of 20 groups. The study revealed a significant ($p < 0.05$) increase in the activities of glutathione peroxidase, glutathione reductase, catalase and TBARS in toxic groups (OTA, T-2 and OTA+T-2). Results of the present study suggest that OTA and T-2 either alone or in combination induce oxidative stress and supplementation of *Curcuma longa*, *Zingiber officinale*, toxichek and activated charcoal in order showed amelioration by stabilizing the antioxidant defenses.

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Pathology of snake bite in cow

H.S. Banga*, R.S. Brar, S.G. Chavhan, H.S. Sandhu and A.M. Kammon

Department of Veterinary Pathology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana

Abstract

Pathology of gross and histopathological lesions are being described in the cow inflicted with a snake bite. The lesions were suggestive of snake bite of Viperidae family, as the lesions were hemotoxic as evidenced in heart, lungs and trachea besides sludging of blood.

Biochemical profiles during endotoxic shock and after hypertonic saline solution, Dexamethasone and Flunixin meglumine administration in buffalo calves

G.S. Ghuman, and D.V. Singh^{1*}

Department of Veterinary Physiology

Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141 004 (India)

Abstract

Endotoxic shock was produced in five apparently healthy male buffalo calves aged between 4 months to 1 year by I/v infusion of *E.coli* endotoxin @ 5 µg/Kg BW/ hour for 3 hours. The animals were further observed for a period of 7 days. A general hypoproteinemia was observed during endotoxin infusion along with significant ($P<0.01$) hypoalbuminemia, hypoglycemia, decrease in plasma globulin, creatinine, BUN and chloride while plasma sodium, potassium, showed non-significant alterations during endotoxin infusion for 3 hours. All the endotoxemic buffalo calves were infused I/v hypertonic saline solution (7.2% NaCl acq.) @ 4ml/Kg BW in 6.5 minutes followed by dexamethasone @ 4mg/Kg BW and flunixin meglumine @ 1.1 mg/Kg BW as one time infusion and plasma proteins showed a significant decrease at 4, 5 and 6 hour and on day 2 and 3 while albumin showed a declining trend throughout the observation period with a significant fall at 3, 4, 5 hour and on day 6 of start of endotoxin infusion. Plasma globulin and other proteins also decreased. Plasma fibrin increased significantly at 6th hour to day 7 i.e., end of the observation period. Hypoglycemia continued from 2nd to 6th hour followed by day 1 -5 accompanied by a significant fall in BUN on day1-3. The plasma creatinine along with sodium and potassium did not alter significantly.

Quantitative measurement of endotoxin, haemolysis and water extractable protein from four brands of surgical latex gloves

G. Sumithra, and P.V. Mohanan*

Toxicology Division, Biomedical Technology Wing, Sree Chitra Tirunal Institute for

Medical Sciences and Technology, Poojapura, Thiruvananthapuram 695 012, Kerala, India

Abstract

In this study, an effort was made to evaluate the quantity of water extractable protein, endotoxin level and percentage haemolysis from four different brands of commercially available surgical latex gloves. The estimation of protein, endotoxin content and percentage haemolysis was carried out as per International standard. The result of the study indicated that the protein, endotoxin and percentage haemolysis were under acceptable limit. Hence, it can be concluded that the protein content of all the four brands of surgical latex gloves can be considered as pyrogen free and non hemolytic, hence safe.