Journal of Pharmacology and Toxicology

ISSN 1816-496X

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Anticancerous Effect of *Typhonium flagelliforme* on Human T4-Lymphoblastoid Cell Line CEM-ss

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Typhonium flagelliforme (Lodd.) Blume, commonly known as rodent tuber in Malaysia, is one of the widely used alternative medicines in cancer therapy by South East Asian population. Intake of this plant is common among patients with malignancies especially Leukaemia, breast and cervical cancer; however no data available regarding the possible direct effect of *T. flagelliforme* in these cancers. The purpose of the present study was to investigate the potential *in vitro* cytotoxic effect of leaves and tubers of *T. flagelliforme* extracts against human T4-lymphoblastoid cell line CEM-ss. Among the 8 extracts Dichloromethane and Ethyl acetate extracts of *T. flagelliforme* demonstrated significant anti proliferative effect with a marked level for both leaves (10.8 and 5.8 μg mL^{-1}) and tuber (6.5 and 8.2 μg mL^{-1}), against CEM-ss cells. Considering all the results collectively *T. flagelliforme* appears to be a promising plant demonstrating anti cancer activity, that requires further investigation. *(Journal of Pharmacology and Toxicology 3 (6): 449-456, 2008; **doi:** 10.3923/jpt.2008.449.456)*

The Hepatoprotective Effect of β-Carotene Against Cadmium Toxicity in Rats

S.A. Bashandy and I.M. Alhazza

The present study was carried out to investigate the potential protective effect of β-carotene against cadmium (Cd) induced hepatotoxicity. Male albino rats were used in the present experiments and divided into three groups. First group served as control, second group injected with $CdCl_2$ (sc) at dose level of 2.5 mg kg^{-1} b.wt. and third group injected intramuscularly with β-carotene (10 mg kg^{-1} b.wt.) and $CdCl_2$ (sc). The injections were 3 times weekly for 6 weeks. Results obtained showed that $CdCl_2$ significantly ($p<0.01$) elevated blood hydroperoxide, AST (Aspartate amino transferase), ALT (Alanine amino transferase), ALP(Alkaline Phosphatase), cholesterol and hepatic cadmium levels. The results demonstrated the beneficial influences of β-carotene in reducing the harmful effects of $CdCl_2$. *(Journal of Pharmacology and Toxicology 3 (6): 457-463, 2008; **doi:** 10.3923/jpt.2008.457.463)*

Histological Evaluation of the Rats Testis Following Administration of a Herbal Tea Mixture

M.B. Maina, S.H. Garba and T.W. Jacks

This research was carried out as a preliminary study to determine the histological effect of a herbal tea mixture on the rat testis. A total of 25 adult male albino rats of the Wister strain were used, they were randomly divided into five groups of five rats each. Group I served as control, while rats in groups II-IV were administered 2, 4 and 8 g kg^{-1} body weight of the herbal tea, respectively for 28 days. Rats in group V were administered 8 g kg^{-1} of the herbal tea for 28 days and allowed to stay for 14 days post treatment to observe for reversibility, persistence or delayed occurrence of toxic effects. At the end of the experimental periods, the animals were sacrificed and the weights of the testes recorded, fixed and processed for routine histological technique. Administration of the herbal tea to rats showed a significant increase in body weights, but testicular weights were unaffected. Histological examination of the rat's testis revealed interstitial edema and congestion of blood vessels in the testes of the treated rats. Withdrawal of the herbal tea for 14 days showed a slight degree of recovery in the rats. These findings suggests that the histological organization of the testis can significantly be altered with continuous and increase use of the herbal tea mixture. Further studies to determine the effect of the tea on the morphometry, biometry and hormonal profile of the rat's testes following long term exposure will be useful. *(Journal of Pharmacology and Toxicology 3 (6): 464-470, 2008;* ***doi:*** *10.3923/jpt.2008.464.470)*

Effects of Folic Acid and Vitamin C on Arsenic Induced Mice

M.E. Ali, M.A. Salam, M.A. Asad, M. Saifuzzaman and M.M. Sarder

In this study, 5 weeks old mice weighing 22±2 g were grouped in four, each group consisting of six animals. Group-I, II, III and IV of the animals were fed by a standard diet quantity sufficient, normal diet with dissolved arsenic, arsenic with folic acid mixed and arsenic with vitamin C mixed, respectively. Blood was collected from the sacrificed animals and the blood glucose levels were determined by spectrophotometrically and glucometer. The average blood glucose level of arsenic induced animals was 9.37 mmol L^{-1} compared to 6.53 mmol L^{-1} in control animals whereas the blood glucose level of Group-III and Group-IV were 6.73 and 7.03 mmol L^{-1}, respectively. Weight gain of the arsenic induced animals was lower compared to that of the animals fed with normal diet, folic acid mixed

diet or vitamin C mixed diet. After sacrifice, the weight of kidney, heart and lung of arsenic induced animals were less than that of the Group-III and Group-IV. The reduction of arsenic induced higher blood glucose level by folic acid and vitamin C demonstrates that folic acid and vitamin C has significant effect in preventing arsenic induced disease. *(Journal of Pharmacology and Toxicology 3 (6): 471-477, 2008; **doi:** 10.3923/jpt.2008.471.477)*

Comparative Effect of Gasoline Vapours on Renal Functions in Male and Female Albino Wistar Rats

F.E. Uboh, M.I. Akpanabiatu and Y. Alozie

The effect of gasoline vapours (17.8±2.6 $cm^3/h/m^3/day$) on renal functions was assessed from the total kidney weights and the levels of serum creatinine, urea and Blood Urea Nitrogen (BUN) in male and female rats, following 64 days of exposure. The results showed an insignificant ($p>0.05$) increase in percentage kidney weight per total body weight (PKW/BW), decrease in total serum protein and a significant increase ($p<0.05$) in serum creatinine, urea and BUN levels in both male and female test rats, compared respectively with the control. However, the percentage changes in the PKW/BW, serum creatinine and urea levels obtained for female rats were observed to be significantly higher ($p<0.05$), compared to the respective percentage changes obtained for male rats. This observation indicates that frequent exposure to gasoline vapours may cause renal dysfunction in rats, with females at greater risk. *(Journal of Pharmacology and Toxicology 3 (6): 478-484, 2008; **doi:** 10.3923/jpt.2008.478.484)*

Systematic Review of Imiquimod for the Treatment of External Genital Wart

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The objective of this review is to assess whether imiquimod provides a therapeutic advantage over placebo (vehicle) or other active therapy used in the treatment of adult patients with external genital and perianal warts/condyloma acuminata. We searched MEDLINE (1966-March 2006), EMBASE (1988-March 2006) and the Cochrane database for randomized controlled trials. Eight RCTs were identified that met the inclusion criteria. None of them compared imiquimod to other active therapy. Seven trials compared imiquimod (1, 2 or 5% cream) to placebo in immunocompetent patients of which only two trials used the recommended dose and dosing regimen with a follow up of 12 weeks duration.

Mortality and serious adverse events were not reported. The effectiveness of imiquimod over other existing therapies for the treatment of external genital/perianal warts has not been established. In immunocompetent patients, there is sufficient evidence to conclude that imiquimod 5% cream applied three times a week for a maximum duration of 16 weeks compared to placebo provides a short term efficacy advantage in terms of complete clearance with no recurrence at the end of 12 weeks of follow up (ARR = 27%, NNT = 4). There were significant increases in several adverse events (erythema ARI = 43%, NNH = 2; erosion ARI = 24%, NNH = 4; excoriation ARI = 22%, NNH = 5; edema ARI = 15%, NNH = 7; scabbing ARI = 13%, NNH = 8 and induration ARI = 6%, NNH = 17). Based on one trial in immunocompromised patients (HIV positive) we conclude that there is insufficient evidence that imiquimod provides a therapeutic advantage compared to placebo. *(International Journal of Pharmacology 3 (1): 1-10, 2007; **doi:** 10.3923/ijp.2007.1.10)*

Adverse Drug Reaction in Children: A Review of Management

K.A. Oshikoya and O.F. Njokanma

With a better understanding of the profiles of the adverse effects of different drugs taken by a patient, prompt recognition and reporting will go a long way in minimizing the incidence of Adverse Drug Reactions (ADRs). A high index of suspicion is required as ADRs may sometimes mimic some diseases. Any organ system may be affected; the most commonly affected organ systems are the skin and appendages, manifesting mostly as morbilliform eruptions. Stevens-Johnson syndrome and toxic epidermal necrolysis are the most severe dermatologic manifestations of ADRs. Good drug history is an essential part of any clinical assessment and it is very important to ask about prescription and non-prescription drugs. The non-prescription drugs should include illicit drugs (in adolescent children), herbal and homeopathic medicines. Laboratory diagnostic tests play no significant role in the diagnosis of ADRs and when required is guided by the suspected pathologic mechanism. Primary preventions of ADRs is the preferred option; there are however therapeutic approaches to established cases. Even though genetics have been known for so long to be involved in the development of ADRs, there is, as yet, no reliable means of predicting the occurrence of ADRs in susceptible children. Not until there is a breakthrough in this area, children will continue to suffer this major problem of drug therapy. *(International Journal of Pharmacology 3 (1): 11-18, 2007; **doi:** 10.3923/ijp.2007.11.18)*

Effects of Quercetin on DNA Damage Induced by Copper Ion

Tan Jun, Zhu Liancai and Wang Bochu

It is well known that DNA damage plays an important role in carcinogenesis. Quercetin, as an antioxidant and free radical-scavenger, is known to protect DNA from damage produced by Reactive Oxygen Species (ROS) such as hydroxyl free radical (·OH), Hydrogen Peroxide (H_2O_2) and superoxide ion ($O_2\cdot^-$). But quercetin has been reported to be carcinogenic too. Based on the contradiction in terms, we study the effect of quercetin on DNA damage in the presence of cupric ion. Present results show that quercetin has opposite effects on DNA damage induced by cupric ion depending on the concentration of cupric ion. At low concentration of cupric ion, quercetin exerted a protective role. While at higher concentration of cupric ion, quercetin promoted DNA cleavage, which was not inhibited by hydroxyl free radical scavenger. Additionally, quercetin diminished slightly the oxidation of CT DNA by cupric ion plus H_2O_2 in the 2-thiobarbituric acid-reactive substances (TBARS) assay. So, it can be concluded that oxidative stress is not the only reason for DNA damage induced by quercetin plus cupric ion. We further propose a mechanism for explaining the promoting effect that formation of quercetin copper (II) complexes binding to DNA in an intercalation mode may result in hydrolytic cleavage of DNA. The results may imply that in certain pathological situations quercetin may result in DNA damage rather than exert a protective role to bring on carcinogenesis. *(International Journal of Pharmacology 3 (1): 19-26, 2007;* ***doi:*** *10.3923/ijp.2007.19.26)*

Effect of Fixed Oil of Nigella Sativa on Male Fertility in Normal and Hyperlipidemic Rats

A.E. Samir Bashandy

High plasma level of cholesterol or triglycerides was associated with poor semen quality and direct adverse effects on testicular function that may lead to male infertility. The effect of fixed oil of *Nigella sativa* (*N. sativa*) on male fertility in normal and hyperlipidemic rats was studied. Induction of hyperlipidemia was done by feeding rats on a diet containing 1% cholesterol, 2% sheep fat and 0.5% cholic acid for 2 months. Oil of *N. sativa* was orally given (0.5mL/rat) for 2 months daily to normal and hyperlipidemic rats. Plasma lipid profile including cholesterol, triglycerides, Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) was evaluated. Fertility index as determined by sex organ weights, plasma testosterone level and sperms evaluation (sperm motility, sperm abnormalities and

sperm count) was investigated. In hyperlipidemic rats (control +ve), there was a marked increase in plasma cholesterol, triglycerides and LDL levels. On the other hand, there was a significant decrease in HDL and fertility index associated with increase in sperm abnormalities. Oral administration of oil of *N. sativa* to either normal or hyperlipidemic rats improved the fertility index as manifested by increase in seminal vesicle weight, testosterone level, sperm motility and sperm count and a decrease in sperm abnormalities. In conclusion, administration of *N. sativa* oil to hyperlipidemic rats improved their reproductive efficiency and produced additional protection against hyperlipidemia induced reduction in fertility. *(International Journal of Pharmacology 3 (1): 27-33, 2007;* ***doi:*** *10.3923/ijp.2007.27.33)*

Modulatory Effects of Ginger and Clove Oils on Physiological Responses in Streptozotocin-Induced Diabetic Rats

Atef M. Al-Attar and Talal A. Zari

The present study was conducted to compare the efficiency of ginger, clove and ginger plus clove oils supplementation in streptozotocin (STZ)-diabetic and non-diabetic male Wistar rats. In comparison with control, highly significant increases in the values of blood glucose (273.72%), triglycerides (34.97%), cholesterol (65.79%), low density lipoprotein LDL-cholesterol (201.07%), total protein (21.09), creatinine (74.31%), urea (82.08%), uric acid (81.23%), alanine aminotransferase (74.36%) and aspartate aminotransferase (34.99%) were observed in STZ-diabetic rats, while the value of high density lipoprotein HDL-cholesterol was markedly declined (21.68%). Administration of ginger oil to diabetic rats resulted in mild increases of the levels of blood glucose, triglycerides, cholesterol, LDL-cholesterol, total protein, urea, uric acid and aspartate aminotransferase, while the value of HDL-cholesterol was significantly decreased. Moreover, the treatment with ginger oil noticeably restored the values of blood creatinine and alanine aminotransferase activity to the control levels. Supplementation of tested oils significantly decreased the haematobiochemical changes in STZ-diabetic rats. In comparison with control, administration of ginger oil or ginger plus clove oils significantly reduced the levels of blood glucose in non-diabetic rats. Reducing effect of ginger oil on the level of blood triglycerides was notably observed in non-diabetic rats. From the present new findings, it was suggested that ginger, clove and ginger plus clove oils supplementation may act as antioxidant agents and these oils could be an excellent adjuvant support in the therapy of diabetic mellitus and its complications. *(International Journal of Pharmacology 3 (1): 34-40, 2007;* ***doi:*** *10.3923/ijp.2007.34.40)*

Effect of the Fractions of the Hexane Bark Extract and Stigmast-4-en-3-one Isolated from *Anacardium occidentale* on Blood Glucose Tolerance Test in an Animal Model

Ruby Lisa Alexander-Lindo, Errol Y.St.A. Morrison, Muraleedharan G. Nair and Donovan A. McGrowder

The study was undertaken to investigate the possible effect(s) of the hexane extract of the bark of *Anacardium occidentale* (cashew) and the fractions collected at different stages of the purification process on glucose tolerance in normoglycaemic dogs. The possible hypoglycaemic effect of stigmast-4-en-3-one isolated from the hexane extract of the bark of *Anacardium occidentale* and cholest-4-en-3-one was also investigated. The hexane extract of the bark of *Anacardium occidentale* was administered at 300 mg kg^{-1} Body Weight (BW) to normoglycaemic dogs followed by an oral glucose tolerance test. There was significant reduction in the fasting and postprandial blood glucose concentrations especially at the 1.0 and 2.0 h time points ($p<0.05$). Subsequent fractions of the hexane extract of the bark of *Anacardium occidentale* showed a hypoglycaemic effect on fasting and postprandial blood glucose concentrations. A hypoglycaemic assay guided extraction, isolation and structure elucidation produced stigmast-4-en-3-one. Stigmast-4-en-3-one administered at 3 mg kg^{-1} BW produced significant reductions in the postprandial blood glucose concentrations especially at the 1.5 h time point ($p<0.05$). Cholest-4-en-3-one at 3 mg kg^{-1} BW (i.v.) was found to be more potent than stigmast-4-en-3-one at the 1.5 h time point ($p<0.05$). The results indicate that stigmast-4-en-3-one isolated from hexane extract of the bark of *Anacardium occidentale* possesses hypoglycaemic activity and this lends credence to the suggested use of this herb in the control and/or management of type 2 diabetes mellitus in Jamaica and other Caribbean islands. *(International Journal of Pharmacology 3 (1): 41-47, 2007;* ***doi:*** *10.3923/ijp.2007.41.47)*

Restorative Effect of *Asparagus racemosus* on Age Related Oxidative Damage in Heart Lysosome of Aged Rats

Sivanandham Velavan and Vava Mohaideen Hazeena Begum

In the present study, we have evaluated the salubrious role of asparagus racemosus root extract (ARRE) on accumulation of oxidative damage products such malondialdehyde (MDA), protein carbonyls (PCO), lysosomal marker enzymes acid phosphatase and cathepsin D activity, aging marker lipofuscin and

membrane bound H^+ ATPase activity in heart lysosome of aged rats. Male albino rats of Wistar strain were divided into four groups: Group 1, young control rats; Group 2, young rats treated with ARRE (500 mg kg^{-1} b.wt.) for four weeks; Group 3, aged control rats; Group 4, aged rats supplemented with ARRE (500 mg kg^{-1} b.wt.) for four weeks. Present results, thus, revealed that ARRE has inhibiting effect on the accumulation of age-related oxidative damages and restored the enzyme activity and decreased the lipofuscin content in heart lysosomes. This restorative activity of ARRE mainly attributed to the presence of enriched therapeutic phytochemical constituents, which act synergistically to alleviate the indices of oxidative stress, associated with aging. *(International Journal of Pharmacology 3 (1): 48-54, 2007;* ***doi:*** *10.3923/ijp.2007.48.54)*

Impact of Sildenafil Citrate (Viagra) and Ethanol Interaction on Antioxidant Defense System in the Adult Male Albino Rats

T.G. Sivasankaran, R. Udayakumar, K. Panjamurthy and V. Albert Singh

The interactive effects of Sildenafil citrate (VIAGRA) and Ethanol Consumption on the antioxidant defense system in testis tissue of rats were studied in the present research work. Male Albino rats were divided into eight groups of six animals each. Control rats were administered normal saline orally. While experimental animals were fed Sildenafil citrate (VIAGRA) (1 μg gm^{-1}) and 18% ethanol (5 g kg^{-1} Body weight) and sacrificed. A significant depletion of GSH content in testis was observed. This combination was found to be decreased Super Oxide Dismutase (SOD) activity in testis. Thio Barbituric Acid Reactive Substrate (TBARS) and Catalase (CAT) Activity were observed to be increased in testis. In contrast, Glutathione Peroxidase (GPx) activity was decreased in testis. The results are discussed in detail. *(International Journal of Pharmacology 3 (1): 55-60, 2007;* ***doi:*** *10.3923/ijp.2007.55.60)*

The Spasmogenic and Spasmolytic Activities of *Lavandula stoechas* are Mediated Through Muscarinic Receptor Stimulation and Calcium Channel Blockade

Qaiser Jabeen, Nauman Aziz, Zeeshan Afzal and Anwarul Hassan Gilani

The crude extract of *Lavandula stoechas* (Ls.Cr) and its fractions were studied *in vitro* for the possible presence of spasmogenic and spasmolytic constituents to rationalize some of the traditional uses. Ls.Cr (1-10 mg mL^{-1}) caused atropine-sensitive spasmogenic effect in guinea pig ileum. In spontaneously contracting

rabbit jejunum, Ls.Cr (0.03-1 mg mL^{-1}) caused a transient spasmogenicity followed by relaxation at higher doses. Ls.Cr also relaxed high K^+- induced contractions at the similar dose range (0.03-1 mg mL^{-1}), which suggests that the spasmolytic effect is mediated through Calcium Channel Blockade (CCB). The CCB effect was confirmed when pretreatment of the tissue with Ls.Cr produced a dose-dependent shift in the Ca^{++} dose-response curves to the right, similar to that produced by verapamil. Activity-directed fractionation revealed that the spasmolytic effect is concentrated in the petroleum fraction while the spasmogenic effect is more evident in the aqueous fraction. These data indicate the presence of both spasmogenic and spasmolytic components mediated through muscarinic receptor activation and calcium channel blockade, respectively. This study also resolves the controversial results obtained from earlier studies and may explain some of its medicinal uses in gut disorders, like constipation and spasm. *(International Journal of Pharmacology 3 (1): 61-67, 2007;* ***doi:*** *10.3923/ijp.2007.61.67)*

Phytochemical Screening and Antibacterial Properties of Organic Solvent Fractions of *Psidium guajava* Aqueous Leaf Extracts

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Resistance of some bacteria, especially some stains of *E. coli* to common antimicrobial agents has created an urgent need to develop alternative antimicrobial drugs from herbs that are safe, cheap and may overcome the resistance of the pathogens. The crude aqueous extract of *Psidium guajava* leaf which is known to possess some antibacterial properties was further subjected to sequential fractionation with organic solvents (chloroform, ethyl acetate, normal butanol) of different polarity. This was done until the organic layer was visibly clear to obtain chloroform, ethyl acetate and n-butanol soluble fractions and residual aqueous fraction. Phytochemical screening and antibacterial activity of organic solvents soluble fractions and residual fraction of the extract on some gram positive and gram negative microbes were carried out. The different fractions showed variation in phytochemical constituency and thus in their antibacterial properties. The ethyl acetate soluble fraction of the extract showed broad spectrum antibacterial properties against all the organisms tested. The fraction also showed a good activity against *E. coli* at a relatively lower concentration and hence could possibly be use against *E. coli* infections. *(International Journal of Pharmacology 3 (1): 68-73, 2007;* ***doi:*** *10.3923/ijp.2007.68.73)*

Antihepatotoxic Activity of *Xylopia phloiodora* Extracts on Some Experimental Models of Liver Injury in Rats

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The antihepatotoxic effects of *Xylopia phloiodora* extracts were evaluated in experimental models of liver injury in rats induced by CCl_4 or paracetamol. Crude extract (CE), ether extract (EE) and essential oils from stem bark or leaves were tested. Hepatic function was accessed by measuring serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in rats. Liver malondialdehyde (MDA) and reduced glutathione were also measured in control and treated rats. *X. phloiodora* leaves (CE) and stem bark (CE) extracts showed hepatoprotective activities at doses equivalent to 2.5 g of plant/kg, since serum levels of ALT and AST in rats given the extracts were significantly low ($p<0.05$ and $p<0.01$, respectively) when compared to control CCl_4-injured rats. Further studies were carried on the CE from stem bark of *X. phloiodora* which showed the highest level of protection against hepatitis. Further studies of the crude extract showed highest antihepatotoxic activity with the ether precipitate (PE) which was effective at 100mg/kg for hepatocurative activity in CCl_4-injured rats. In experiments comparing the PE (100 mg kg^{-1}) to a reference antihepatotoxic substance (silymarin) the PE exhibited a 71 and 80% hepatoprotection compared to the 80 and 90% one exhibited by silymarin in CCl_4-and paracetamol-injured rats respectively. This study demonstrated that ether precipitate of Xylopia phloiodora was effective in protecting the liver from toxic hepatitis. *(International Journal of Pharmacology 3 (1): 74-79, 2007;* ***doi:*** *10.3923/ijp.2007.74.79)*

Biological and Toxicological Study of Aqueous Root Extract from *Mitragyna inermis* (*Willd oktze*) Rubiaceae

Yamba Ouédraogo, Innocent Pierre Guissou and Odile Germaine Nacoulma

We reported the results of biological and toxicological study, realized on *Mitragyna inermis Willd Oktze*, one specie of family of Rubiaceae, well known in traditional medicine in Burkina Faso for his intensification potentialities of resistance against multiple pathologies like infectious and parasitic diseases, adynamia, rheumatic and osteoarthritis diseases. So we have formulated hypothesis of stimulation of organism's defenses for a scientist research. The steeping freeze-dried of the plant's product has been used for different assays:

General acute toxicity estimation on Ico mouse (NMRI Han) by intraperitoneal route and orally administration on rabbit from the value of LD50 obtained with the mouse. Biological study: The kinetic interaction between the plant's product chemical group and the evolution of biological elements medium of immunity on the rabbit, has been appreciated. The biological elements include white blood cells, red blood cells, lymphocytes, platelets, total proteins, albumin and globulins. The following results have been obtained about the study: A Lethal Dose (LD50) resulted from maceration (acute general toxicity) at the rate of 800 mg kg^{-1} of corporal weight showing a bit toxic product. An interaction between vegetable's extract chemical group and biological elements of rabbit which is expressed by: An increasing (13 to 18%) of total proteins from serum; this increasing was notably after 24 h of administration. Albumin decreasing of 10% in comparison with initial rate, indicated haptens action of plant's extract chemical products. α1, α2, β and γ globulins increasing, respectively 46.8, 14.31 and 26% during the first day of administration of the extract. A lymphocyte increasing of 35% 24 h after administration of the product. This rate is more increased after the second administration; White blood cells are also increasing. These results show an obvious capacity of the plant's macered extract to stimulate organism natural defenses in relation with antigenous-antibody reaction. This will be an interesting perspective for complementary treatment of pathology like HIV diseases. *(International Journal of Pharmacology 3 (1): 80-85, 2007;* ***doi:*** *10.3923/ijp.2007.81.85)*

Analgesic and Anti-inflammatory Effects of Methanolic Extract of *Pausinystalia macroceras* Stem-Bark in Rodents

Paul A. Nwafor, T.W. Jacks and A.U. Ekanem

The effect of methanolic extract of *Pausinystalia macroceras* stem-bark was investigated in chemically-induced inflammation in rodents. The extract dose-dependently (17.5-350.0 mg kg^{-1}) inhibited acetic acid-induced writhing, formalin-induced pain licking and carrageenin-induced hind paw oedema in rodents. The extract also inhibited both the fresh egg albumin and prostaglandin E_2-induced inflammations as well as capsaicin-induced nociception in rats. These inhibitions were statistically significant ($p<0.01$-0.001). This effect may in part involve suppression of capillary permeability through neurogenic and non-neurogenic pathways. *(International Journal of Pharmacology 3 (1): 86-90, 2007;* ***doi:*** *10.3923/ijp.2007.86.90)*

Antidiabetic and Hypolipidaemic Effects of Ethanolic Root Extract of *Setaria megaphylla*

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Evaluation of antidiabetic and hypolipidaemic activity of ethanolic root extract of *Setaria megaphylla* as well as its acute toxicity was carried. The extract was found to be slightly toxic with LD_{50} value of 2074.8 mg kg^{-1}. Treatment of alloxan-induced diabetic rats with the extract caused a significant ($p<0.01$) reduction in fasting Blood Glucose Levels (BGL) of the diabetic rats both in acute study and prolonged treatment (15 days). The activity of the extract was comparable to that of the reference drug, Glibenclamide. *Setaria megaphylla* treatment showed a considerable lowering of serum total cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol and an increase in HDL cholesterol in the treated diabetic group. This results suggest that the root extract of *Setaria megaphylla* possesses antidiabetic and hypolipidaemic effect in alloxan-induced diabetic rats. *(International Journal of Pharmacology 3 (1): 91-95, 2007;* ***doi:*** *10.3923/ijp.2007.91.95)*

Preliminary Toxicity and Phytochemical Studies of Aqueous Bark Extract of *Helicteres isora* L.

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The present study was designed to determine the preliminary oral toxicity profile of the aqueous extract of bark of *Helicteres isora* L. (HIL) in rats and its active chemical constituents by way of phytochemistry. The acute oral toxicity study was conducted using limit dose test of up and down procedure according to the OECD/OCDE Test Guidelines on Acute Oral Toxicity (AOT425statPgm, version: 1.0) at a limit dose of 2000 mg/kg/p.o. Repeat dose oral toxicity studies were conducted by daily oral dosing of 500 mg kg^{-1} b.wt. of HIL dissolved in 1 mL of 0.9% saline and 1 mL of 0.9% saline to rats in the test and control groups, respectively, for 28 days. On day 29, blood samples for bioassays were collected by cardiac puncture under chloroform anesthesia. The phytochemical analysis was conducted using standard procedures. The LD_{50} estimate of the extract was calculated to be greater than 2000 mg/kg/p.o. The extract caused a significant ($p<0.05$) decrease in weight gain, differential eosinophil count and increase in serum creatinine but did not affect the organ weights, other serum electrolytes (Na^+, K^+, HCO_3), liver enzymes and other hematological indices in test rats. Its phytochemical analysis showed it contains saponins, flavonoids, alkaloids, tannins,

phlobatannins, glycosides, reducing sugars and anthraquinones. These results show that the aqueous extract of *Helicteres isora* is relatively safe toxicologically when administered orally. Thus, its use in folkloric medicine as an oral antidiabetic is relatively safe when used over the tested period. *(International Journal of Pharmacology, 3 (1): 96-100, 2007; **doi:** 10.3923/ijp.2007.96.100)*

Effect of Ginsenosides on Malondialdehyde, Nitric Oxide and Endothelin-1 Production in Vascular Endothelial Cells Suffering from Lipid Peroxidation Injury

Tan Jun, Zhu Liancai and Wang Bochu

Ginsenosides are the main effective substance in *Panax ginseng* and have bioactivity to improve cardiovascular function. In this study, effect of ginsenosides on malondialdehyde (MDA), Nitric Oxide (NO) and endothelin-1 (ET-1) production in human vascular endothelial cells strain VEC304 treated with diamide was studied. The treatment of VEC304 with 0.01 $\mu L \cdot L^{-1}$ diamide significantly increased MDA production ($p<0.01$), significantly decreased NO production ($p<0.05$) and slightly increased ET-1 production in cells, indicating that diamide induced lipid Peroxidation injury for VEC304. While after VEC304 injured by lipid peroxidation were treated with ginsenosides, MDA production and ET-1 production in cells were decreased significantly ($p<0.01$) by 29.81 and 38.18%, respectively and NO production in cells was increased significantly ($p<0.01$) by 6.04 times. The results implied that *Panax ginseng* and ginsenosides work effectively on cardiovascular diseases probably by anti-oxidation and increasing NO production and decreasing ET-1 production in VEC. *(International Journal of Pharmacology 3 (1): 101-105, 2007; **doi:** 10.3923/ijp.2007.101.105)*

In vitro Antimicrobial Activity and Phytochemical Analysis of *Jatropha curcas* Roots

O.O. Aiyelaagbe, B.A. Adeniyi, O.F. Fatunsin and B.D. Arimah

Jatropha curcas is an ornamental plant which is also employed to cure various infections in traditional medicine. The hexane, ethyl acetate and methanol extracts of this plant were analysed phytochemically and screened against different microorganisms responsible for various infections especially sexually transmitted diseases. Phytochemical analysis of the extracts revealed the presence of many secondary metabolites including steroids, alkaloids and saponins. The extracts and purified fractions displayed potent antimicrobial activity against the target

organisms giving MIC as low as 0.75 μg mL^{-1}. The results confirmed the potency of this plant in treating infections including sexually transmitted infections. *(International Journal of Pharmacology 3 (1): 106-110, 2007;* ***doi:*** *10.3923/ijp.2007.106.110)*

Studies on the Anti–Inflammatory and Analgesic Properties of Chenopodium Ambrosioides Leaf Extract in Rats

G.F. Ibironke and K.I. Ajiboye

A methanol extract of the dried leaves of Chenopodium ambrosioides was investigated for anti-inflammatory and analgesic activities. The extract (300-700 mg kg^{-1}, p.o.) produced a dose related inhibition of carrageenan-induced paw oedema and cotton pellet-induced granuloma in rats. At the same doses, analgesic effect was also observed with the hotplate device maintained at 55°C as well as on the early and late phases of formalin-induced paw licking in rats. The results of the present study further confirm the use of Chenopodium ambrosioides traditionally for the treatment of painful inflammatory conditions. *(International Journal of Pharmacology 3 (1): 111-115, 2007;* ***doi:*** *10.3923/ijp.2007.111.115)*

Effect of Mulberry (*Morus alba* L.) Leaves Extract on the Secretion and Content of Triglyceride in the Chicken Hepatocytes Primary Culture

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In present study, twelve 6 week age chickens were decapitated; liver extracted, sliced and cultured as primary culture. Effects of hydro extract of mulberry leaf on TG secretion and hepatic TG were determined. Data indicated that hydro extract of mulberry leaf extract decreased triglyceride secretion in a dose dependent manner (as much as 82, 76 and 67% in response to 0.075, 0.05 and 0.015% of hydro extract after 48 h incubation, respectively). Moreover, at 0.075 concentration it decreased TG content as much as 43% after 12 h incubation. Mulberry leaves contain some inhibitory components for accumulation and secretion of TG in chicken hepatocytes. *(International Journal of Pharmacology 3 (1): 116-119, 2007;* ***doi:*** *10.3923/ijp.2007.116.119)*

Supplementation effect on Body Weight and BMI of HIV-positive/AIDS patients

O.O. Oguntibeju, W.M.J van den Heever and F.E. van Schalkwyk

This is the first preliminary study in the Free State Province of South Africa to have examined the possible effect of a locally produced nutritional supplement on the body weight and Body Mass Index (BMI) of HIV-positive/AIDS patients. The parameters were determined according to standard procedures in 35 HIV-positive/AIDS patients at baseline and in 28 patients at the end of the study. Twenty-four (68.8%) of the 35 patients examined at baseline had BMI within normal range while the median body weight was 57. Twenty-eight patients completed the study. The results showed that 19 (67.9%) had a BMI within the normal range after supplementation for three months. The body weight showed a slight but insignificant decline ($p>0.05$) at the end of the study. In general, BMI produced a trend towards an improvement. Further studies are recommended. *(International Journal of Pharmacology 3 (1): 120-122, 2007;* ***doi:*** *10.3923/ijp.2007.120.122)*

Effect of Dates and Gahwa (Arabian Coffee) Supplementation on Lipids in Hypercholesterolemic Hamsters

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The aim of present study to evaluate the effect of dates, gahwa and their combination on lipid metabolism in hypercholesterolemic hamsters. The increase intake of dates and gahwa (Arabian coffee) along with a high cholesterol diet in Saudi population as well as increased incidence of cardiovascular disease (CVD) has raised a concern about the effects of the Saudi diet on CVD risk. Golden Syrian hamsters were divided into six groups (six animals in each) as follows: 1) control (chow), 2) Dates-diet (50% date pulp with chow), 3) Dates-diet + gahwa (replaced with drinking water), 4) cholesterol-diet (1% cholesterol in chow), 5) dates-diet + 1% cholesterol, 6) Dates-diet + gahwa + 1% cholesterol. All the above dietary preparations were made every week and supplemented for 13 consecutive weeks. Plasma lipid profile including total cholesterol, triglycerides (TC), Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL) were estimated. Total cholesterol and TC were estimated in liver, heart and kidney tissues. The high cholesterol-diet caused significant increase in body and organs

(liver and kidney) weights as compared to controls. Dates-diet, significantly reduced the body and liver weight that increased by the high cholesterol-diet. Plasma lipids were significantly elevated by high cholesterol-diet supplementation and this increase was significantly decreased by the dates-diet. However, hepatic TC levels further increased when dates were combined with high cholesterol-diet supplementation. Gahwa intake either with dates alone or with high cholesterol-diet was not induced any significant changes in lipid parameters. In conclusion, the dates lowering effects on body weights and plasma lipid profile shows its beneficial affects against atherosclerosis development in humans. Further investigations required for f ind out its potential constituents that affecting the CVD risk. *(International Journal of Pharmacology 3 (2): 123-129, 2007;* ***doi:*** *10.3923/ijp.2007.123.129)*

Possible Associations of Splice Site Mutation of Dihydropyrimidine Dehydrogenase (IVS14+1G>A) in Adverse Drug Reactions in Some Invasive Ductal Carcinoma Patients

Ch. Kalyana Kumar, Sudha Murthy and Kaiser Jamil

To determinethe frequency of the IVS14+1G>A mutation in the DPD gene in the South Indian population, we have carried out PCR based genotyping allowing the rapid analysis of the IVS14+1G>A mutation by RFLP. For screening for the presence of this mutation a total of 112 breast cancer biopsy samples and 82 healthy controls were included in our study. Out of 112 breast cancer patients 72 individuals were on 5-FU treatment. In this group we identified 6 heterozygous and 2 homozygous mutations confirming the prevalence of about 5.3 and 1.7% mutations in the invasive Ductal carcinomas. In healthy controls out of 82 we found 2 (2.5%) naturally occurring heterozygous mutations. In this study the prevalence of the IVS14+1G>A mutations in IDC'S were found to be significant with an increased risk upon 5-FU administration. Mutations of the DPD gene results in severe DPD deficiency. DPD deficient patients have shown splice-site polymorphism, IVS14+G-A (i.e., a G to A alteration in the nucleotide at the exon 14 acceptor splice site), the corresponding mRNA therefore lacks exon 14 and the enzymatic activity of the translated DPD protein being virtually absent. It is therefore concluded that genetic screening for the presence of this mutation in cancer patients would be useful before the administration of 5-FU, in the Indian population suffering from breast cancer. *(International Journal of Pharmacology 3 (2): 130-136, 2007;* ***doi:*** *10.3923/ijp.2007.130.136)*

Mechanism of the Anti-inflammatory Activity of *Khaya senegalensis* A. Juss. (Meliaceae)

M. Lompo, I.P. Guissou, J. Dubois, J.P. Dehaye, S. Ouedraogo, A. Traore and N. Some

In the present study, the antipyretic, analgesic and antiphospholipase A_2properties were investigated to explain the antiinflammatory effect of the stem barks aqueous extract. Yeast-induced hyperthermia in rat test was used to evaluate the antipyretic effect; writhing response induced by acetic acid in mice and rat tail-flick tests were used for antinociceptive effect. The effect of extract on the release of Arachidonic Acid (AA) and Oleic Acid (OA) in P388D1 cells was also investigated for the inhibitory activity of Phospholipase A_2. It was found that 1 g kg^{-1} of extract inhibited significantly Yeast-induced hyperthermia about 100% only 1 h after administration. The extract inhibited significantly the writhing response. The ED_{50} of extract was 157.821 mg kg^{-1} wile ED50 for Aspirin was 65.09 mg kg^{-1}. The reaction time to thermal stimuli was prolonged significantly ($p<0.05$) in dose-dependant manner in rats treated with 500 mg kg^{-1} (5.93 sec) and 750 mg kg^{-1} (7.08 sec) versus the control (4.32 sec) at 60 min. The extract inhibited the release of arachidonic (59.69%) and oleic acid (27.63%) and so inhibited Phospholipase A_2 activity in P388D1 cells. *(International Journal of Pharmacology 3 (2): 137-142, 2007;* ***doi:*** *10.3923/ijp.2007.137.142)*

NEffect of *Vernonia amygdalina* Del Leaf on Kidney Function of Diabetic Rats

I.J. Atangwho, P.E. Ebong, M.U. Eteng, E.U. Eyong and A.U. Obi

This research assessed the hypoglycemic action of ethanolic extract of *Vernonia amygdalina* del and its impact on selected indices of kidney function in experimental diabetic rat models. Twenty-one Wistar rats (120-160 g) assigned to 3 groups of seven rats each were used. Groups 1 and 3, constituting the diabetic (DC) and normal controls (NC), respectively were both given placebo treatment, whereas group 2 was the test group of animals administered the extract (400 mg kg^{-1} body weight) by gastric-intubation for 14 days. Results of analyses of serum electrolytes and biochemical indices showed: significant reductions ($p<0.05$) in glucose, urea and sodium concentrations of the *V. amygdalina* ethanolic extract treated group (144.14±25.83, 81.60±16.52 and 65.00±6.24, respectively) relative to their respective controls (247.25±4.83, 122.08±10.60 and 116.62±12.00). Serum chloride levels of the test group also reduced, whereas, that of potassium and creatinine were elevated with respect to their

normal control values. However, these later changes were non-significant ($p>0.05$). Histological changes in the kidney tissues such as necrosis of tubules, degeneration of cells of glomerular capsule and partial obliteration of glomerular tuft observed in diabetic animals were reversed in extract treated diabetic group. *Vernonia amygdalina* extract besides its hypoglycemic action, can protect against kidney impairments due to diabetes, but may induce dilutional hyponatraemia. *(International Journal of Pharmacology 3 (2): 143-148, 2007;* ***doi:*** *10.3923/ijp.2007.143.148)*

Modulatory Role of *Asparagus racemosus* on Glucose Homeostasis in Aged Rats

Sivanandham Velavan and Vava Mohaideen Hazeena Begum

Normal aging is usually associated with a progressive deterioration in most endocrine functions that may be responsible for serious disturbances of metabolic homeostasis. Impairment of glucose homeostasis is a well-known feature of aging. Regulation of glucose metabolism is a key aspect of metabolic homeostasis and insulin is the dominant hormone influencing this regulatory system. Glucose seems to be central to the phenomenon of aging and age-related diseases. Medicinal plants are believed to be much safer and proved elixir in the treatment of various ailments. The modulatory effect of *Asparagus racemosus* on plasma glucose, insulin, insulin resistance index and metabolic liver enzymes such as hexokinase, glucose-6-phosphatase and fructose-1,6-bisphosphatase were evaluated in young and aged rats. In aged rats, the increased levels of all the variables except the activity of hexokinase were observed. Supplementation of *Asparagus racemosus* root extract (ARRE) to aged rats restored the age associated altered activity of enzymes and plasma parameters. The results of the present study suggest that the ARRE regulated the glucose homeostasis in aged rats as like young rats. Supplementation could maintain the activity of enzymes and plasma parameters in young rats. These modulatory effects of ARRE may be attributed to the presence of enriched therapeutic phytochemical constituents. *(International Journal of Pharmacology 3 (2): 149-154, 2007;* ***doi:*** *10.3923/ijp.2007.149.154)*

Effect of *Equisetum arvense* L. (*Equisetaceae*) in Microalbuminuria and Creatinine Excretion in Streptozotocin-Induced Diabetes in Male Rats

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In the present research, the methanolic extract of *Equisetum arvense* was analysed for its antidiabetic activity in streptozotocin-induced diabetic rats. The

efficacy of the extract was also evaluated for protection of renal defects in diabetic rats. The blood glucose lowering activity of the methanolic extract was determined in steptozotocin-induced (50 mg kg^{-1}, i.p.; dissolved in normal saline) diabetic rats, after oral administration in doses of 50, 100, 250 and 500 mg kg^{-1} daily for 5 weeks. Urine samples were collected before the induction of diabetes and at the end of 5 weeks of treatments and analyzed for urinary microalbumin and creatinine level. The data was compare statistically using one-way ANOVA tukey test. The results showed that in different doses of methanolic extract blood sugar decreased significantly in comparison with the treatment and control groups of diabetic rats. Also the weights of methanolic-extract treatment group were higher than the other treatment groups. The present studies clearly indicate a significant antidiabetic and renoprotective effect with the methanolic extract of *Equisetum arvense* and lend support for its traditional usage. *(International Journal of Pharmacology 3 (2): 155-159, 2007;* ***doi:*** *10.3923/ijp.2007.155.159)*

Repeatedly Heated Frying Oil and High Cholesterol Diet are Detrimental to the Bone Structure of Ovariectomised Rats

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Oxidative stress and hypercholesterolemia have been shown to contribute to post-menopausal osteoporosis. In post-menopausal women, the use of repeatedly heated frying oils may aggravate oxidative stress condition while intake of high cholesterol diet may worsen hypercholesterolaemia. The aim of this study is to determine the combined effects of repeatedly heated (five times) frying oils (palm or soy oil) and high cholesterol diet on the bone structure of ovariectomised rats, an animal model of post-menopausal osteoporosis, by using bone histomorphometry. It was found that the addition of fresh or once-heated palm or soy oil into high cholesterol diet was able to protect ovariectomised rats bone from structural deterioration. However, when these oils were repeatedly heated, the protective effects were lost and the bone structures of the ovariectomised rats were either maintained by palm oil or worsen by soy oil. *(International Journal of Pharmacology 3 (2): 160-164, 2007;* ***doi:*** *10.3923/ijp.2007.160.164)*

Evaluating the Antibacterial Activity of *Elephantopus scaber* Extracts on Clinical Isolates of β-lactamase Producing Methicillin Resistant *Staphylococcus aureus* from UTI Patients

R. Jasmine, P. Daisy and B.N. Selvakumar

Methicillin Resistant *Staphylococcus Aureus* (MRSA) has gained much attention in the last decade, as the MRSA is a major cause of hospital acquired

(nosoconical infections). β-lactam antibiotics are the preferred drugs against *S. aureus* infections, although *S. aureus* has developed resistance to the β-lactam antibiotics due to the production of chromosomal or plasmid mediated β-lactamases or by producing Pencillin Binding Proteins (PBPs). The Extended Spectrum β-Lactamase (ESBL) producers are highly resistant to several conventional antibiotics. This limits therapeutic options. Hence efforts are now taken to screen few medicinal plants, which are both economic and less toxic, against the ESBL producers. Among the several plants screened, we have chosen to screen the alcohol extracts of a traditional medicinal plant, *Elephantopus scaber* (Asteraceae) against several clinical strains of ESBL producing MRSA. ESBL producers were screened by double disc synergy test. Methanol, hexane and acetone extracts of *Elephantopus scaber* were investigated for their ability to inhibit the growth of the chosen ESBL producing multidrug-resistant bacteria by the disc diffusion method. Minimal Inhibitory Concentrations (MICs) were determined by micro broth dilution method. Synergistic interaction of plant extracts with certain antibiotics was also evaluated. On the basis of promising activity, acetone extracts were fractionated and their phytochemical analysis showed the presence of terpenoids, proteins and traces of steroids. TLC bioautography of the fraction showed the active compound to be terpenoids. The strong *in vitro* antibacterial activity of terpenoid derivatives against ES βL-producing MRSA bacteria suggests the compounds might find wide pharmaceutical use. Further investigations to elucidate the active compound are required. *(International Journal of Pharmacology 3 (2): 165-169, 2007;* ***doi:*** *10.3923/ijp.2007.165.169)*

Antibacterial Activity of Marine Bacterium *Pseudomonas* sp. Associated with Soft Coral *Sinularia polydactyla* against *Streptococcus equi* Subsp. *zooepidemicus*

Ocky Karna Radjasa, Siti Isrina Oktavia Salasia, Agus Sabdono, Jutta Weise, Johannes F. Imhoff, Christop Lämmler and Michael J. Risk

A marine bacterium associated with soft coral *Sinularia polydactyla* collected from Bandengan water, Jepara, North Java Sea, Indonesia, was successfully screened for antibacterial activity against pathogenic bacterium *Streptococcus equi* subsp. *zooepidemicus* K6.72 isolated from infected monkey of the island of Bali and identified based on morphological, biochemical and molecular methods. Marine bacterium was identified as *Pseudomonas* sp. based on its 16S rDNA and was found to amplify gene fragments of Non-ribosomal peptide synthetase (NRPS). Cloning and subsequent sequencing, a 360 bp long DNA fragment was

obtained and the deduced amino acid sequence showed conserved signature regions for peptide synthetases and revealed a high similarity of 61.1% to genes peptide synthetase of *Bacillus subtilis*. *(International Journal of Pharmacology 3 (2): 170-174, 2007; **doi:** 10.3923/ijp.2007.170.174)*

Effect of a Polyherbal Formulation (*Diarun plus*) on the Glycemic Status Modified by Physiological Means in Non-diabetic Mice and Rats

G. Senthilvel, Anoop Austin, M. Jegadeesan, P. Thirugnanasambantham, N. Narayanan and S. Viswanathan

Diarun plus a polyherbal formulation containing herbal ingredients of folkloric Antidiabetic effect, was investigated for its effect on glycemic status in rats and mice. In contrast to conventional chemical induced diabetic animal models, changes in glycemic states were induced by physiological maneuvers. Results revealed that in euglycemic animals *Diarun plus* elicited little change (-10 to +10%) insignificantly. In food deprivation/swim exercise induced hypoglycemia, *Diarun plus* reduced the degree of hypoglycemia in both rats and mice (From 38 to 27% in rats and 45 to 32% in mice). Similarly, the marked hyperglycemia induced by dextrose (70% in rats and 95% in mice) was reduced markedly to 8 and 25%, respectively. The findings of the present study suggests that the ingredients of *Diarun plus* have the unique property of maintaining near euglycemic state irrespective of the altered glycemic state and that have no significant effect in euglycemic condition. *(International Journal of Pharmacology 3 (2): 175-178, 2007; **doi:** 10.3923/ijp.2007.175.178)*

Comparison of Nitrofurantoin and Trimethoprim-Sulphamethoxazole for Long-Term Prophylaxis in Children with Recurrent Urinary Tract Infections

Behnaz Falakaflaki, Ramazan Fallah, Mohammad Reza Jamshidi, Farzaneh Moezi and Zohreh Torabi

The objective of this study was to compare prophylactic effect of nitrofurantoin and trimethoprim-sulphamethoxazole (TMP-SMX) in recurrent Urinary Tract Infections (UTI) in children and to determine antibiotic resistance pattern while receiving prophylaxis. One hundred and thirty two patients in two similar groups were randomized to receive either TMP-SMX (n = 66) or nitrofurantoin (n = 66) as single night dose for 6 months. Age, sex, indication for prophylaxis, occurrence

of UTI, culture and sensitivity results were recorded. Patients were categorized into three age groups: 3-12 months, 1-5 years, 6-12 years. Nitrofurantoin was more effective than TMP-SMX in preventing recurrent UTI. Recurrence rate was 36.2% in nitrofurantoin group compared with 63.8% in the TMP-SMX group ($p = 0.029$). This protective effect was more significant in children aged 1-5 years compared to other age groups ($p = 0.046$). In nitrofurantoin group, 37.5% of the organisms causing the UTIs were resistant to drug. In TMP-SMX group, 56% of the organisms were resistant to the prophylactic agent. Nitrofurantoin has a lower rate of recurrence and causes less emergence of resistance bacteria than TMP-SMX, therefore is more suitable for prevention of recurrent UTI in children. *(International Journal of Pharmacology 3 (2): 179-182, 2007;* ***doi:*** *10.3923/ijp.2007.179.182)*

Propacetamol and Morphine in Postoperative Pain Therapy after Renal Transplantation

Mohammad Reza Khajavi, Atabak Najafi, Mehdi PanahKhahi and Reza Shariat Moharari

The purpose of this study was to assess the analgesic efficacy and complication of intravenous propacetamol, compared with morphine after renal transplantation. In this randomized double blind study, 30 end stage renal disease candidates for renal transplantation from live donors, were divided into two groups: the first group (15 patients) received 2 g of propacetamol (IV), while the other group received 5 mg of morphine (IV). The intensity of pain and the complications were evaluated for 24 h (each 6 h). The mean intensity of pain in the group who received morphine was slightly lower than propacetamol at recovery (10 min after extubation) and 24 h following the operation. However, propacetamol showed significantly less adverse events. The analgesic efficacy of Morphine in controlling post operative pain in time (0) and 24 h following the operation was significantly greater than propacetamol whilst the latter showed less adverse effects during the study period. *(International Journal of Pharmacology 3 (2): 183-186, 2007;* ***doi:*** *10.3923/ijp.2007.186.186)*

In vivo Antioxidant Potentials of Rosa Damascene Petal Extract from Guilan, Iran, Comparable to α-tocopherol

Sanaz Shahriari, Narguess Yasa, Azadeh Mohammadirad, Reza Khorasani and Mohammad Abdollahi

Rosa damascena Mill, (Rosaceae) is a widely cultivated ornamental plant. Several therapeutic effects including calmative, antianxiety, laxative and antispasmodic have been described for the flower of *R. damascena*. The petals of *R. damascena* are

specially used as cardiotonic by the people of Guilan province. In this study antioxidant potential of *R. damascena* petals were determined by FRAP test and its ability to inhibit lipid peroxidation was determined by TBARS test in rat. *In vivo* examination was performed by oral administration of ethanol extract of *R. damascen*a petals at doses of 50, 75, 100 and 200 mg/kg/day for 10 days which compared to vitamin E (10 mg/kg/day) and control groups. *In vivo* evaluation of antioxidant effects of *R. damascene* with these two methods showed that the extract of *R. damascena* has a high ability to inhibit lipid peroxidation and has a high antioxidant power with all doses comparing to control ($p<0.001$). The highest activity was observed with the dose of 200 mg/kg/day. This preliminary study indicates the interesting anti oxidative stress activity of *R. damascena*, which is comparable to the known antioxidant compound, alpha-tocopherol. *R. damascena* can be considered as a medicinal source for the treatment and prevention of many free radicals related diseases. *(International Journal of Pharmacology 3 (2): 187-190, 2007;* ***doi:*** *10.3923/ijp.2007.187.190)*

Fatty Acid Profile and Antimicrobial Susceptibility of *Aeromonas salmonicida* Isolated from Rainbow Trout

Serdar Bektas, Ozer Ayik and Telat Yanik

In vitro susceptibilities of 30 *Aeromonas salmonicida* strains isolated from rainbow trout (*Oncorhynchus mykiss*) were determined against to 23 antimicrobials by using disc diffusion method. According to antimicrobial susceptibility tests results, *A. salmonicida* strains were found susceptible to all antibiotics tested except for the ampicilin and vancomycine. The major fatty acids, used as indicators for identification of the bacteria, were found as 14:0 3OH/16:1 ISO I, 16:1 w7c/15 ISO 2OH, 16:0 and 18:1 w7c, respectively. *(International Journal of Pharmacology 3 (2): 191-194, 2007;* ***doi:*** *10.3923/ijp.2007.191.194)*

Phenoxybenzamine Treatment Is Insufficient to Prevent the Stress-induced Effects in Rat Gastrointestinal Tract

Maleki Hadi and Malekinejad Hassan

Phenoxybenzamine (POB) as an irreversible α-adrenoceptor antagonist was used to evaluate any possible therapeutic effects on stress-induced disorders in defecation in rats. In this study restriction stress was conducted on control and treated groups of rats with 0.1 and 1% of POB in a 2 mg kg^{-1} dose. After

performing of restriction and drug administration, the frequency and weight of dropped faecal pellets were determined between 0-6, 6-12 and 12-24 h. The observed data showed no significant differences between control and treated animals ($p>0.05$). Present data suggest that although no significant differences have been observed in this trial but it could not be excluded due to other pharmacokinetic factors of phenoxybenzamine, which requires further studies to be conducted to elucidate more detail about it. *(International Journal of Pharmacology 3 (2): 195-197, 2007; **doi:** 10.3923/ijp.2007.195.197)*

Biochemical Effects of the Seed Extract of *Telfairia occidentalis* in Rats

O.A. Eseyin, I. Udoh, A. Ekpo, E.J. Edoho and A.C. Igboasoiyi

Effect of the ethanol extract of seed of *Telfairia occidentalis* in rat was evaluated. 100, 250, 500 and 1000 mg kg^{-1} of the extract was orally administered daily to four different groups of Wistar albino rats (127±13 g) for 28 days. The fifth group of rats (i.e., control) received saline water only. On the 29th day blood was collected from the overnight fasted rats through cardiac puncture under chloroform anaesthesia. Appropriate commercial (Randox^{R}) kits were used to analyze the blood serum for the following enzymes and biomolecules: Aspartatetransaminase (ASAT), alaninetransaminases (ALAT), alkaline phosphatase, total cholesterol, High density lipoproteins (HDL), Triglyceride (TG), creatinine, total proteins, total and conjugated bilirubin and glucose. The extract significantly increased the serum levels of total cholesterol, total proteins, total bilirubin, conjugated bilirubin and glucose; but decreased the levels of HDL. *(International Journal of Pharmacology 3 (2): 198-200, 2007; **doi:** 10.3923/ijp.2007.198.200)*

Comparison of Diclofenac with Pethidine on the Pain after Cesarean Section

Haleh Rahmanpoor, Seyed Nejat Hosseini, Seyed Nouraddin Mousavinasab, Parvin Tadayon and Fatemeh Karimi

Pain relief of good quality after Cesarean Section (CS) results in early mobilization and good early mother-child interaction. Usually Narcotics are using for analgesia after CS pain have side effects like sedation, nausea, ileus and respiratory depression. The object of this study is the comparison of pain relief by rectal Diclofenac and intra muscular pethidine and comparison of their side effects. In a

randomized single blind study 122 patients undergoing both emergency and elective CS for the first time were studied. The study group received 100 mg rectal diclofenac immediately after CS followed by 100 mg Diclofenac every 8 h for the first 24 h. The control group received 25 mg pethidine immediately after CS then 25 mg every 8 h for the first 24 h. Then the pain in 2 groups was evaluated by visual analogue score. The result showed that the visual analogue score for pain was significantly lower in diclofenac group. Incidences of vomiting and ileuses do not have any difference in two groups and was not reported early post-partum hemorrhage in any group. Rectal Diclofenac provides effective analgesia for CS pain and there was not significant difference between the 2 groups regarding incidence of vomiting and ileus. *(International Journal of Pharmacology 3 (2): 201-203, 2007; **doi:** 10.3923/ijp.2007.201.203)*

Spontaneous Pneumothorax in a Patient with Osteosarcoma During Treatment with Methotrexate

A. Saadat, N. Jonaidi Jafari, H. Khedmat, H.R. Jalalian, M. Izadi and M.J. Hosseini

Methotrexate is a commonly prescribed antineoplastic and immune modulating compound that has gained wide acceptance in the management of rheumatoid arthritis, psoriasis, sarcoidosis and a number of neoplastic disorders. High dose methotrexate with folinic acid rescue is widely used to treat osteosarcoma, which predominantly afflicts children. Although generally considered safe and easy to use, methotrexate has been associated with a number of adverse reactions. Serious toxicity may affect the lungs, liver and bone marrow. Pulmonary complications of methotrexate may be classified as inflammatory, infectious and possibly neoplastic. We describe a patient with osteosarcoma who presented with leg pain and subsequently developed a spontaneous pneumothorax during treatment with Methotrexate. *(International Journal of Pharmacology 3 (2): 204-206, 2007; **doi:** 10.3923/ijp.2007.204.206)*

Comparison of Postoperative Analgesic Effect of Tramadol With Lidocaine When Used as Subcutaneous Local Anesthetic

Sussan Soltanimohammadi and Mirsadegh Seyedi

We conducted a double blind, controlled trial comparing postoperative analgesic effect of tramadol with lidocaine when used as subcutaneous local anesthetic. Seventy ASA physical status 1 or 2 patients aged 20-50 years, who were scheduled for elective surgery under general anesthesia with flank incision, were

randomly assigned to receive either 2 mg kg^{-1} tramadol or 1 mg kg^{-1} lidocaine at the end of operation. Postoperative pain was evaluated with a Verbal Analogue Scale (VAS). First VAS and patient's satisfaction with operation were recorded at recovery room, second record was in the ward (12 h later) and third on the next day of surgery (24 h later). Local reactions, nausea and vomiting in recovery and the ward and time to first request for analgesic after operation were also recorded. Satisfaction with operation in recovery room was better in tramadol group ($p = 0.016$). The VAS score did not differ significantly between the two groups in recovery ($p = 0.119$), 12 h ($p = 0.316$) and 24 h after the operation ($p = 0.108$). Time to first analgesic requirement in tramadol group was longer (4.3±0.3 h) than lidocaine group (2.1±0.9 h) ($p = 0.012$). Ten patients in tramadol and 2 in lidocaine group had nausea in recovery room ($p = 0.01$). Eight and three patients had nausea in the ward, respectively ($p = 0.101$). There was not significant difference in vomiting between two groups in the recovery and the ward ($p = 0.106$ and $p = 0.112$, respectively). No local reactions were recorded in either group. This study showed that subcutaneous administration of tramadol provided local anesthesia equal to lidocaine with longer pain-free period after operation. *(International Journal of Pharmacology 3 (2): 207-209, 2007;* ***doi:*** *10.3923/ijp.2007.207.209)*

Antiinflammatory and Antinociceptive Effects of *Galega purpurea* Root

M. Gupta, U.K. Mazumdar and P. Gomathi

The present study was designed to investigate anti-inflammatory and antinociceptive activities of *Galega purpurea* root. In this study both acute and chronic inflammation models were used to evaluate the anti-inflammatory activity of the extract and four different animal models were employed to investigate the antinociceptive activity of the extract. In acute model carrageenan, dextran, histamine and serotonin models were used to induce inflammation in rat hind paw and cotton pellet-induced granuloma method was used for chronic inflammation model. Acetic acid-induced writhing, method hot plate method, tail flick response and tail immersion methods were used to evaluate the antinociceptive effect of the extract. The methanol extract of *Galega purpurea* root exhibited significant, dose-dependent activity on the tested experimental animal models. Also the extract significantly reduced the acetic acid-induced abdominal contractions and the increased reaction time of mice in hot plate method, tail flick response and tail immersion method. This study has shown that the methanol extract from the roots of *Galega purpurea* does possess significant antiinflammatory and antinociceptive activity in laboratory animals at the doses tested and the results were comparable

to those observed for the standard drugs indomethacin, acetyl salicylic acid and morphine. *(International Journal of Pharmacology 3 (3): 210-218, 2007;* ***doi:*** *10.3923/ijp.2007.210.218)*

Inhibitory Effects of a Flavonoid-Rich Extract of *Pistacia vera* Hull on Growth and Acid Production of Bacteria Involved in Dental Plaque

Yousef Yari Kamrani, Massoud Amanlou, Babak Esmaeelian, Soheila Moradi Bidhendi and Mahnaz SahebJamei

The aim of present study was to investigate the antibacterial and the *in vivo* efficacy of aqueous, chloroformic and ethanolic extracts from *Pistacia vera* on bacteria involved in dental plaque. The growth inhibitory activity of the extracts were tested against *Strep. mutans*, *Strep. salivarious*, *Strep. sobrinus* and *Strep. Sanguis*. The bioautography and TLC analysis were used to provide relevant information on the chemical properties of extracts. Antimicrobial activity determined by agar well diffusion and determination of MIC values was measured by the liquid serial dilution culture method. Bactericidal and bacteriostatic, inhibition of glycolysis and sucrose-dependent adherence to smooth glass surface were tested using standard methods. The subjects used the mouthrinse and saliva samples were collected after 10 min, 1 and 3 h post-rinsing. The total streptococcal counts were measured before and after mouthrinsing. Aqueous, chloroformic and ethanolic extracts of *P. vera* hull inhibited the growth and acid production of tested bacteria. The result revealed that the ethanolic extract of *P. vera* hull displayed the most potent antimicrobial activity. *In vitro* studies had shown that ethanolic extract of *P. vera*, at concentrations of 2, 6 and 10% w/v, could inhibit the growth as well as the acid-producing ability of *Strep. mutans*. In *in vivo* study which was tested on three subjects shows that mouthrinse prepared by suspending 10% of ethanolic extract in PEG 300 (w/v) could reduced salivary bacterial count more than 55%, about 75% inhibition of adherence and inhibition of salivary glycolysis up to 3 h post rinsing. *(International Journal of Pharmacology 3 (3): 219-226, 2007;* ***doi:*** *10.3923/ijp.2007.219.226)*

A Comparative Study upon the Cytoprotective Effect of Prostaglandin F2α and Acetaminophen on Indomethacin and Absolute Alcohol-induced Gastric Damage in Rat

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This study was undertaken to investigate the comparison of the ability of a cytoprotective synthetic PGF2α and acetaminophen, to protect rat gastric mucosa

against indomethacin and absolute alcohol. Fasted male rats received intragastric pretreatment of acetaminophen or either orally or IP PGF2α 30 min prior to either indomethacin (20 mg kg^{-1}, oral suspension) or 1 mL of orally administered absolute alcohol. In another series of experiments rats were given acetaminophen concurrently with oral suspension of indomethacin or absolute alcohol. The animals were scarified 1 or 5 h after absolute alcohol or indomethacin administration respectively and the gastric mucosa was assessed for gross necrosis and for histologic changes. The results of this study showed that pretreatment with acetaminophen or PGF2α significantly reduced gross histologic changes and deep histologic necrosis versus control group. Co-administration of acetaminophen produced reduction in gastric lesions significantly, but this effect was less than when administered 30 min prior to indomethacin or absolute alcohol. The data obtained indicated effective protection of the gastric mucosa against ethanol and indomethacin injury can be achieved by oral administration of acetaminophen, probably through stimulation of gastric prostaglandins secretion. *(International Journal of Pharmacology 3 (3): 227-233, 2007;* ***doi:*** *10.3923/ijp.2007.227.233)*

Erythrocyte Membrane Deformation and Antihemolytic Effect of Antituberculosis Drugs in Rats

B.A.S. Lawal, R.B. Ashorobi and O.O. Adeyemi

The commonly used antituberculosis (antiTB) drugs; pyrazinamide (PZA), isoniazid (INH), ethambutol (ETB) and rifampicin (RMP) were administered to albino rats for the purpose of investigating the toxic consequences of combination therapies. The drugs were evaluated by simulating the normal clinical dosage and a 24 week gavage studies of standard therapy with antituberculosis drugs in albino rats without disease were carried out. The doses employed were: Isoniazid, 5 mg kg^{-1}; rifampicin, 10 mg kg^{-1}; ethambutol, 20 mg kg^{-1} and pyrazinamide, 25 mg kg^{-1}. The effect of clinically equivalent antiTB regimen and established oxidant drug, aminopyrine, on membrane lipid peroxidation and osmotic fragility in rat red cells was examined. The regimen showed evidence of protection against hemolysis both *in vitro* and *in vivo* although there are evidences of distorted erythrocyte membranes which appeared to be approaching a star-shaped configuration and an enhanced antihemolytic effect in hypotonic saline solution. Since star-shaped erythrocytes have been shown to be devoid of ATP, this may have consequences on the physiological function of the red blood cells. *(International Journal of Pharmacology 3 (3): 234-240, 2007;* ***doi:*** *10.3923/ijp.2007.234.240)*

Anticonvulsant and Analgesic Effects of *Harpephyllum caffrum* Bernh. ex C.F. Krauss [Anacardiaceae] Stem-Bark Aqueous Extract in Mice

John A.O. Ojewole and George J. Amabeoku

This study was undertaken to evaluate the anticonvulsant and analgesic effects of *Harpephyllum caffrum* stem-bark aqueous extract (HCE) in mice. The anticonvulsant effect of the plant's stem-bark extract (HCE, 50-800 mg kg^{-1} intraperitoneally) was examined against pentylenetetrazole (PTZ)- and picrotoxin (PCT)-induced seizures, while the analgesic effect of the extract (HCE, 50-800 mg kg^{-1} I. p.) was evaluated by hot-plate and acetic acid analgesic test methods. *H. caffrum* stem-bark extract (HCE, 100-800 mg kg^{-1} I. p.) dose-dependently and significantly delayed ($p<0.05$-0.001) the onset of the seizures and profoundly antagonized, PTZ- and PCT-induced seizures. Moreover, HCE (50-800 mg kg^{-1} I. p.) produced dose-dependent, significant analgesic effects ($p<0.05$-0.001) against thermally and chemically-induced nociceptive pain in mice. The findings of the present study appear to suggest that *H. caffrum* stem-bark aqueous extract produces its anticonvulsant effect by enhancing GABAergic neurotransmission and/or action in the brain. The results also seem to suggest that *H. caffrum* stem-bark extract possesses centrally- and peripherally-mediated analgesic properties. Although the precise mechanisms of the anticonvulsant and analgesic actions of HCE could not be established, the findings of this laboratory animal study indicate that *H. caffrum* stem-bark aqueous extract possesses anticonvulsant and analgesic properties. These findings lend pharmacological credence to the suggested folkloric, ethnomedical uses of the plant as a natural supplementary remedy in the management or control of childhood convulsions and epilepsy, as well as in the treatment or management of painful conditions in some rural communities of South Africa. *(International Journal of Pharmacology 3 (3): 241-247, 2007; **doi:** 10.3923/ijp.2007.241.247)*

Effect of Calcium Channel Blocker Nicardipine on Brain Edema in Rats

Bahram Bibak, Mohammad Khaksari, Mohammad Badavi and Ali Rashidy-Pour

The aim of the present study was to examine the therapeutic effect of nicardipine on diffuse brain injury. Male Wistar adult rats were subjected to a diffuse brain

injury. Nicardipine, as a calcium channel blocker was injected intravenously 15 min following induction of injury at doses of 10 or 20 μg kg^{-1}. Quantitative measurements of water content, as index of brain edema and Evans Blue (EB) content as index of blood brain barrier permeability were determined using standard procedures. The histological examination was done by hematoxylin-eosin staining. The results indicated that there were no significant differences in the percent of water content between nicardipine treated, trauma alone and trauma + vehicle groups. The content of EB was significantly lower in nicardipine-treated groups in comparison with trauma and trauma + vehicle groups. There was no difference between nicardipine and other groups in histological verification. The present data indicated that nicardipine could have a protective effect on vascular permeability after brain injury. *(International Journal of Pharmacology 3 (3): 248-253, 2007* ***doi:*** *10.3923/ijp.2007.248.253)*

Phytonutrient: Effects on Lipid Peroxidation in Experimental Gastritis Induced by Restraint Stress

M.F. Nur Azlina and M.I. Nafeeza

In this research we studied the effect of free radical scavengers on restraint-induced lesions in rats. Forty rats were divided into 2 equal sized groups; a control group that was given a vitamin E deficient diet and a treatment group that was given the same diet but with oral supplementation of palm-based phytonutrient complex (PPC) at 60 mg kg^{-1} body weight for 28 days. At the end of the treatment period, half the numbers of rats in each group were sacrificed while the remaining half were subjected to daily restraint-stress for 2 h on 4 consecutive days. The rats were sacrificed after the fourth exposure, their stomach isolated and examined for lesions, gastric PGE_2 content, gastric malondialdehyde level and the gastric reduced glutathione level were measured as an index to reflect the scavenging abilities of PPC. Present findings showed hemorrhagic gastric lesions in rat exposed to stress. Rats that received PPC had less gastric lesions compared to the non-stressed control. The malondialdehyde level was also significantly lower in rats given PPC supplementation compared to the control while the reduced glutathione levels were preserved. We conclude that it is indeed probable that oxygen radicals are involved in the pathogenesis of restraint stress-induced lesions thus supplementation with antioxidant such as PPC may be able to reduce or inhibit the formation of these lesions. *(International Journal of Pharmacology 3 (3): 254-259, 2007;* ***doi:*** *10.3923/ijp.2007.254.259)*

Antispasmodic Effect of *Anethum graveolens* Fruit Extract on Rat Ileum

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The aim of the present study was to investigate the effect of Dill Fruit Hydroalcoholic Extract (DFHE) on the rat ileum contractions induced by some known spasmogens and also to study the possible mechanism(s) involved. Dill fruit extract was prepared by macerated with alcohol (70%). A piece of ileum (2 cm) was removed from male Wistar rats and mounted in an organ bath containing air bubbled Tyrode solution with 0.5 g initial tension and contractions were recorded by an isotonic transducer. The precontracted ileum by KCl (60 mM), ACh (1 μM) and $BaCl_2$ (4 mM) were relaxed by the cumulative concentrations (0.5-4 mg mL^{-1}) of DFHE ($p<0.0001$). The relaxatory effect of the extract on the $BaCl_2$-induced ileum contractions was greater than the other spasmogens. The spasmolytic effect of the extract (1 mg mL^{-1}) was not reduced after tissue incubation (20-30 min) with phentolamine (1 μM), propranolol (1 μM), naloxone (1 μM) and L-NAME (100 μM). In high-potassium (120 mM) Ca^{2+}-free Tyrode solution, cumulative concentrations of $CaCl_2$ (0.225-3.6 mM) induced ileal contractions, however, the extract (0.5-2 mg mL^{-1}) reduced these contractions dose-dependently ($p<0.001$). Present results suggest that the α- and β-adrenoceptors, opioid receptors and NO generation are not involved in the DFHE inhibitory effect. Furthermore, the results suggest that the relaxatory effect of DFHE on the ileum may be due to blockade of voltage dependent calcium channels. *(International Journal of Pharmacology 3 (3): 260-264, 2007;* ***doi:*** *10.3923/ijp.2007.260.264)*

Pharmacokinetics of Amoxicillin/Clavulanic Acid Combination after Oral Administration of New Suspensions Formulation in Human Volunteers

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The pharmacokinetic properties of amoxicillin and clavulanic acid when used alone or in combination may show an interaction between these two agents that might decrease the absolute bioavailability of clavulanic acid. In an open, randomized, replicated Latin square under fasting condition, the pharmacokinetics of new formulations of amoxicillin/clavulanic acid were compared with reference formulation after single dose administration in 15 healthy male volunteers. Subjects

were given equal molar doses of new suspension formulations of amoxicillin/clavulanic acid or Augmentin® as reference product. After one week wash-out period blood samples were collected exactly before and after drug administration of any formulations at different time points up to 6 h. The concentrations of the antibiotics in plasma were measured by validated high-performance liquid chromatography methods. Three formulations exhibited a similar mean C_{max} and T_{max} either for amoxicillin or for clavulanic acid. The $AUC_{0\text{-}inf}$ for amoxicillin was about 1278±172 μg min mL^{-1} and it was about 354±66 μg min mL^{-1} for clavulanic acid. There were no significant differences in pharmacokinetic parameters between three formulations. The two generic formulations investigated in this study proved to be bioequivalent with brand-name Augmentin® with regard to the pharmacokinetic parameters C_{max}, $AUC_{0\text{-}t}$, $AUC_{0\text{-}inf}$ and t_{max}. We may conclude that two new formulations are bioequivalent with reference suspension and can be considered equally effective in medicinal practice. Moreover, there were no interaction in pharmacokinetic parameters between amoxicillin and clavulanic acid. No serious adverse event was observed with the studied drugs. *(International Journal of Pharmacology 3 (3): 265-269, 2007;* ***doi:*** *10.3923/ijp.2007.265.269)*

Interactions between Retinol and Some Established Antimalarials in *Plasmodium yoelii nigeriensis* Infection in Mice

A.I. Oreagba and R.B. Ashorobi

The aim of present study was to investigate the effect of retinol on the efficacy of chloroquine and dihydroartemisinin against *Plasmodium yoelii nigeriensis* infected mice. Sixty Swiss albino mice of either sex and average weight of 18-25 g were inoculated with *Plasmodium yoelii* and divided into 5 treatment groups: retinol alone, chloroquine alone, chloroquine and retinol, dihydroartemisinin alone, dihydroartemisinin and retinol and control group (retinol vehicle). Treatment was started on the fifth day (post inoculation) and continued for 5 consecutive days. The level of Malondialdehyde (MDA) in the treatment group was also measured to determine the extent of lipid peroxidation. The result of the study showed that retinol increased the antiplasmodial effect of chloroquine while antagonizing that of dihydroartemisinin. The lipid peroxidation assay also showed that retinol reduced the extent of oxidative stress when combined with dihydroartemisinin while not having any significant effect on lipid peroxidation when combined with chloroquine. The co-administration of retinol may enhance the activity of chloroquine but reduce the antimalarial potency of artemisinin. *(International Journal of Pharmacology 3 (3): 270-274, 2007;* ***doi:*** *10.3923/ijp.2007.270.274)*

Richness of Secondary Metabolite-Producing Marine Bacteria Associated with Sponge *Haliclona* sp.

Ocky Karna Radjasa, Agus Sabdono, Junaidi and Elena Zocchi

A total of 8 bacterial isolates associated with sponge *Haliclona* sp. collected from Bandengan water, Jepara, North Java Sea, Indonesia, was successfully screened for antibacterial activity against pathogenic bacteria *Vibrio parahaemolyticus*, *Aeromonas hydrophila* and *Staphylococcus aureus*. Active bacterial isolates were rapidly grouped by using rep-PCR and a dendrogram was constructed. Five isolates were selected based on the constructed dendrogram for subsequent DNA sequencings resulted in the richness of secondary metabolite-producing sponge associated-bacteria having closest similarity to *Vibrio parahaemolyticus*, *Pseudovibrio denitrificans*, *Pseudoalteromonas* sp., alpha proteobacterium and uncultured bacterium clone. The present study highlighted the repetitive-PCR method as a powerful tool for estimating the richness of secondary metabolite-producing parts among sponge colonizers. *(International Journal of Pharmacology 3 (3): 275-279, 2007;* ***doi:*** *10.3923/ijp.2007.275.279)*

Nematocidal Compounds from the Seeds of *Balanites aegyptiaca* Isolation and Structure Elucidation

C. Gnoula, P. Guissou, P. Duez, M. Frédérich and J. Dubois

The research aims are to characterize this anthelmintic activity and to isolate the main nematocidal agent of *Balanties aegyptiaca* plant. The anthelmintic activity was evaluated *in vitro* by means of an original anthelmintic assay using *Caenorhabditis elegans* as a biological model. Fluorescence microscopy was used for the determination of the percentage of worms death. The structure elucidation was based on NMR, mass spectroscopic analysis and chemical methods. A bioassay-directed fractionation of the aqueous extract of *Balanites aegyptiaca* led to the isolation of balanitin-7 (also named diosgenin 3β-O-β-D-xylopyranosyl-(1→3)-β-D-glucopyranosyl-(1→4)-[α-L-rhamnopyranosyl -(1→2)]-β-D-glucopyranoside), as being the principal nematicidal agent. These data indicate that balanitin-7 has an appreciable nematocidal activity, which is not mediated by inducing an anti-acetylcholinesterase activity. *(International Journal of Pharmacology 3 (3): 280-284, 2007;* ***doi:*** *10.3923/ijp.2007.280.284)*

Hypocholesterolemic Effects of Purslane Extract on Serum Lipids in Rabbits Fed with High Cholesterol Levels

Ahmad Movahedian, Alireza Ghannadi and Mahboobeh Vashirnia

The purpose of this study was to investigate the effect of hydroalcoholic extract of Purslane leaves on serum lipids of rabbits fed with a hypercholesterolemic diet. Therefore different groups of animals were fed either the normal chow diet or a diet enriched in cholesterol (0.5%). Moreover, hypercholesterolemic animals were treated with or without different doses of Purslane extract (200, 400, 800 mg kg^{-1} body weight) orally for 12 weeks. Blood samples were obtained at 0, 6 and 12 weeks after treatment to analyze serum lipids and Atherogenic Index (AI) which is equal to total cholesterol- HDL cholesterol/HDL cholesterol. We show that the serum total cholesterol decreased in all groups treated with purslane extract. Its also found that the distribution of cholesterol between lipoproteins were Changed so, low density lipoprotein cholesterol (LDL-C) decreased significantly in all of the groups treated with purslane extract with respect to positive control group. All treated animals also showed a decrease in AI These findings indicate that this plant may be useful for the treatment of hypercholesterolemia. *(International Journal of Pharmacology 3 (3): 285-289, 2007;* ***doi:*** *10.3923/ijp.2007.285.289)*

Modifying Effects of *Piper longum* on Cell Surface Abnormalities in 7, 12-dimethylbenz(A) Anthracene Induced Hamster Buccal Pouch Carcinogenesis

Namasivayam Senthil, Shanmugam Manoharan, Subramanian Balakrishnan, Cinnamanoor Rajamani Ramachandran, Radhakrishnan Muralinaidu and Kasinathan Rajalingam

Present study has investigated the modifying effects of ethanolic extract of *Piper longum* dried fruits (PLDFEE) on cell surface abnormalities in DMBA induced hamster buccal pouch carcinogenesis. DMBA painting in hamster buccal pouch three times per week for 14 weeks resulted in well developed, well differentiated squamous cell carcinoma. An increase in glycoconjugates (protein bound hexose, total sialic acid and fucose) in plasma and buccal mucosa tissues and decrease in erythrocyte membrane glycoconjugates were observed in DMBA painted hamsters as compared to control animals. Oral administration of (PLDFEE) restored the status of glycoconjugates and lipids during DMBA induced oral carcinogenesis. Our results indicate that (PLDFEE) has protected the cell surface and maintained the structural integrity of the cell membranes during DMBA

induced hamster buccal pouch carcinogenesis. *(International Journal of Pharmacology 3 (3): 290-294, 2007; **doi:** 10.3923/ijp.2007.290.294)*

Anti-Stress Potential of Aqueous Root Extract of *Cnestis ferruginea*

I.O. Ishola and R.B. Ashorobi

This study presents the results of the phytochemical screening, acute toxicity testing and anti-stress potential of aqueous root extract of *Cnestis ferruginea* in mice and rats. The forced swimming endurance test, anoxic tolerance tests and immobilization stress-induced gastric ulcer were utilized as models for the evaluation of the anti-stress property of *C. ferruginea*. The results from phytochemical tests showed the presence of alkaloids, flavonoids, saponins and glycosides as the major constituents of the root extract of *C. ferruginea*. The acute toxicity test showed a wide margin of safety with a median lethal dose (LD50 of 3.6570 g kg^{-1}) in mice. In the forced swimming test, *C. ferruginea* at a dose range of (300-500 mg kg^{-1}, p.o) significantly decreased the duration of immobility in a dose-related manner. These results showed that the extract is a potential anti-stress agent. In the anoxic tolerance test, the extract prolonged the mean time (min) before convulsion in mice in a dose-dependent manner. Also in the immobilization stress-induced gastric ulcer, the extract prevented gastric ulcer formation in rats immobilized and subjected to stress (cold) at 4°C for 2 h after pretreatment with the aqueous root extract. This further confirmed the anti-stress potential of the extract. In conclusion, the root extract of *C. ferruginea* is a potential anti-stress agent. *(International Journal of Pharmacology 3 (3): 295-298, 2007; **doi:** 10.3923/ijp.2007.295.298)*

Detection of Long-Acting Oxytetracycline Residue Levels in Tissue of Desert Sheep Following Intramuscular Injection

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Twelve healthy desert sheep were injected intramuscularly (IM) with multiple doses of 5 g kg^{-1} oxytetracycline (OTC) for detection of OTC residues in different tissues (Liver, kidney, muscle and site of injection). The animals were slaughtered and the tissue samples were collected from each sheep at times 1, 3, 7 and 10 days after drug administration. Samples were processed using microbiological method. The inhibition zone diameters were interpreted with

oxytetracycline standard curve to obtain tissue concentrations. Oxytetracycline concentrations were evaluated in tissue at different times. High concentration were noted in liver (105±10.91 μg g^{-1}) at day 1, kidney (234.93±10.57 μg g^{-1}) at day 3 and muscle (3084.20±227.10 μg g^{-1}) at day 1, while the highest concentrations were observed at site of injection (5963±227.10 μg g^{-1}) at day 1. Day 7 and 10 showed low concentration of OTC in the liver (2.51±0.1 μg g^{-1}), kidney (6.70±0. 1 μg g^{-1}) and muscle (70.86±0.6 μg g^{-1}). This study indicates the presence of long acting OTC concentrations in various tissues after injection of the drug. Significant difference in concentrations of the drug in the various tissues studied was demonstrated. *(International Journal of Pharmacology 3 (3): 299-301, 2007; **doi:** 10.3923/ijp.2007.299.301)*

Interaction of Artemisinin Based Antimalarial Drugs with Hemin in Water-DMSO Mixture

P.T. Mpiana, B.K. Mavakala and Yu Zhi-Wu

The interaction of hemin with artemisinin, artesunate and dihydroartemisinin was investigated by UV-Visible Spectroscopy at pH 9 and High Performance Liquid Chromatography/Diode Array Detector/Mass Spectrometry (HPLC/DAD/MS) for their reactivity with hemin. It has been showed that artesunate and dihydroartemisinin interacted more strongly with Fe (III) PPIX that artemisinin did. The reported results showed too that hemin and endoperoxide lactone derived antimalarials slowly react to give rise to several stereoisomers supramolecular adducts (three for artesunate, seven for artemisinin and eight isomers for dihydroartemisinin) while in contrast, only heme (Fe^2) was found to react with artemisinin based drugs in previous studies. Based on this result, our work confirmed the mechanism in which the artemisinin derivates approach hemin by pointing O1 at the endoperoxide linkage toward iron center, a mechanism that is controlled by steric hindrance. After that C3-C4 bond is cleaved to give rise carbon radical at C4 as predicted by automated calculation of docking of artemisinin to heme. *(International Journal of Pharmacology 3 (4): 302-310, 2007; **doi:** 10.3923/ijp.2007.302.310)*

Hypotensive and Antihypertensive Effects of *Aframomum melegueta* Seeds in Humans

B.A.S. Lawal, A.O. Aderibigbe, G.A. Essiet and A.D. Essien

The current study was designed to determine the effects of the seeds of *Aframomum melegueta* (AM) on the cardiovascular function in both normal and

hypertensive human subjects. Normal subjects serving as controls and divided into three groups; A, B and C as well as hypertensive subjects in groups; D and E, were drafted into this study. Baseline Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Heart Rate (HR) values were taken before ingestion of 10, 15 and 20 seeds, respectively in normals and 10 and 20 seeds respectively in hypertensives. Measurements of the above parameters were taken for a duration of 1 h at 10 min intervals post ingestion. Two weeks after, the same protocol was carried out on normal subjects except that group A acted as control (no seeds) and groups B and C took 10 seeds each. Thirty minutes after the start of the protocol, groups A and B were subjected to Vasalva maneuver while group C was subjected to Cold Stress maneuver all for 1 min. An additional 31 min measurement was taken at the end of the procedures. Ingestion of these seeds resulted in the lowering of cardiovascular indices such as SBP, DBP, PP and MAP in normotensives and hypertensives, respectively. All were found to be significantly different from control values ($p<0.01$). Percentage reductions, though similar between normotensives and hypertensives, were however greater for SBP averaging (15-16%) than DBP (9-10%). The results of this study show that seeds of AM exert a potent effect on the blood pressure in both normotensive and hypertensive subjects. The results suggest a central effect but peripheral vasodilatation effect cannot be ruled out probably via the nitric oxide-cGMP pathway. The degree of reduction is within safety limits indicating its potential usefulness in managing hypertension in young and elderly hypertensive patients. *(International Journal of Pharmacology 3 (4): 311-318, 2007;* ***doi:*** *10.3923/ijp.2007.311.318)*

Effects of Diltiazem on Electrolytes Homeostasis in Streptozotocin-Induced Diabetic Rats

Najma Shaheen, Syed Muhammad Shahid and Tabassum Mahboob

Calcium concentration plays an important role in the development of diabetic complications in tissues permeable to glucose like liver, blood vessels of retina, kidney and central and peripheral nervous systems. This study was designed to investigate the possible involvement of intracellular electrolytes in antihypertensive effects of diltiazem in diabetes. In diltiazem treated control rats serum, heart, kidney calcium and magnesium were significantly decreased where as RBC, heart potassium and magnesium and Na-K-ATPase activity were significantly increased as compared to control animals. In STZ-induced diabetic rats serum sodium,

magnesium, RBC potassium, ATPase activity, heart and kidney potassium were significantly decreased while serum potassium, glucose, RBC and heart sodium were significantly increased. In diltiazem treated diabetic rats serum and heart magnesium and serum glucose were increased where as RBC, heart, kidney sodium, heart, kidney calcium, kidney magnesium and kidney potassium were decreased significantly as compared to control rats. It is assumed that total peripheral resistance, systemic blood pressure and after load is decreased and thus diltiazem is useful in managing angina and hypertension in diabetes by decreasing calcium and sodium in heart and kidney tissues. Diltiazem may be useful in improving the clinical benefits for cardiovascular complications in diabetes. *(International Journal of Pharmacology 3 (4): 319-326, 2007;* ***doi:*** *10.3923/ijp.2007.319.326)*

Screening of *Alafia multiflora* for Antibacterial, Antiradical Activity and LD_{50} Investigation

David E. Tsala, Dimo Theophile, Ngondi Judith, Nnanga Nga, Penlap B. Veronique, Boda Maurice and Njifutie Njikam

The purpose of this investigation deals with the antibacterial, antiradical activities and the toxicity (LD_{50} and haematological parameters) of *Alafia multiflora* stem barks. *A. multiflora* is a medicinal plant known for its curative effects on ulcerous wounds. Antibacterial activities of crude extracts were evaluated against *E. coli*, *S. aureus*, *E. agglomerans*, *P. aeruginosa*, *P. vulgaris*, *K. Pneumoniae* and the inhibitory zones as well as the Minimum Inhibition Concentrations (MIC) determined. Antiradical activity and total phenolic compounds of the extracts were evaluated. Methanol, methylene-chloride/methanol and aqueous extracts inhibited the growth of all the test microorganisms with MIC values ranged from 2.5 to 40 mg mL^{-1}. The best antiradical activity was obtained at 0.25 mg mL^{-1}. These results suggest that *A. multiflora* possess antibacterial and antiradical constituents. Aqueous and the methanol extracts administered in single oral doses of 0, 2.5, 5, 7.5 and 10 g kg^{-1} to groups of 10 rats (5 males, 5 females) yielded no mortality after 7 days observation. The LD_{50} values of the tested extracts were found to be above 5000 mg kg^{-1}, indicating that *A. multiflora* is rather poorly toxic. A significant increase of platelet count was observed in animals treated with aqueous and methanol extracts at 5 to 10 g kg^{-1}. *(International Journal of Pharmacology 3 (4): 327-333, 2007;* ***doi:*** *10.3923/ijp.2007.327.333)*

Nutritive Value, Phytochemical and Antifungal Properties of *Pergularia tomentosa* L. (Asclepiadaceae)

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This study was aimed to assess the nutritive value, phytochemical constituents and antifungal activity of leaf, root and stem extracts of *Pergularia tomentosa*. Chemical composition of leaf, stem and root extracts of the plant were determined using standard methods. Aqueous and organic solvents extracts of the plant parts were screened for antifungal activity using agar dilution method. Phytochemicals detected in the leaf and stem extracts were alkaloids, cardiac glycosides, cyanogenic glycosides, saponins, flavonoids, tannins and anthraquinones. The roots contain trace amounts of cyanogenic glycosides, cardiac glycosides, saponins, tannins and anthraquinones. Mineral element composition of the plant showed higher amount of phosphorus and potassium in the root and stem and sodium, magnesium and calcium in the leaf extracts. All the plant parts used contain high percentages of carbohydrates and crude fibre ranging from 53.27±1.75 to 61.31±2.84% and 16.33±0.29 to 23.17±0.58%, respectively. Lipids (6.83±0.76%), ash (17.17±1.04%) and crude protein contents (6.39±0.17%) were higher in the leaf extracts while the stem was of higher moisture (10.67±0.76%) content. Hexane (HX), Petroleum Ether (PE) and chloroform (CHL) leaf, stem and root extracts were active against all the isolates tested with percentage inhibitions ranging from 41.90±5.63 to 97.52±0.28%. The organic solvent extracts demonstrated near complete inhibitions of the fungal isolates at 8.00 mg mL^{-1} while the aqueous (AQ) extracts of the plant parts inhibited the growth of the isolates at 27.17±7.79 to 97.45±0.21% with near complete inhibition of the tested isolates also at 8.00 mg mL^{-1}. The results showed that the leaf, root and stem extracts of *Pergularia tomentosa* have potential nutritional and antifungal uses. *(International Journal of Pharmacology 3 (4): 334-340, 2007;* ***doi:*** *10.3923/ijp.2007.334.340)*

Tramadol Effects on the Activity Levels of ATPases in Mitochondrial Fractions of Rat Brain Areas During Non-Induction of Pain

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In the present investigation, changes in Na^+/K^+-, Mg^{2+}- and Ca^{2+}-ATPase enzyme activities in different areas of rat brain were examined under the administration of

the synthetic opioid analgesic drug tramadol in the absence of induction of pain. Male adult Wistar rats were used as the experimental animals with five groups of six rats each, housed in separate cages. Tramadol was injected subcutaneously into the rats and the changes in enzyme activities in different brain areas were followed at 3, 6, 12 and 24 h following drug administration. The enzyme activities showed a decrease in all areas of the brain following administration of single dose of tramadol and by 24 h they returned more or less to the respective control levels. In the brain of control rats, pons-medulla registered the highest Na+/K+-ATPase activity. Following tramadol administration, maximal decrease was recorded in cortex at 6 h. The Mg^{2+}-ATPase activity in control rats was found to be highest in cortex. On tramadol dosing, maximal decrease was recorded in hypothalamus and cortex. Ca^{2+}-ATPase activity was found to be highest in cortex in the brain of control rats. The activity of this enzyme showed a decrease in all areas of the brain following tramadol administration, with maximal decrease in hippocampus at 3 h. Minor deviations from the respective controls at this period were negligible and not statistically significant. The results indicate that the administration of tramadol during non-induction of pain would induce decrement in the activities of the ATPase enzymes, indicating its impact on energy metabolism and membrane transport functions. *(International Journal of Pharmacology 3 (4): 341-346, 2007;* ***doi:*** *10.3923/ijp.2007.341.346)*

The Effects of Methanolic Seed Extract of *Garcinia kola* on Some Specific and Non-Specific Immune Responses in Mice

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The modulatory activity of methanolic seed extracts of *Garcinia kola* (ME) on Delayed-Type Hypersensitivity (DTH) response, primary and secondary humoral responses and on *in vivo* leucocytes mobilisation were evaluated. Acute toxicity test of the extract was also carried out. The ME at 250 and 500 mg kg^{-1} body weight produced significant ($p<0.05$) inhibition of DTH response in mice by 67.40 and 53.29%, respectively. Primary and secondary sheep red blood cells-specific antibody titres were significantly elevated when compared to the control group. Agar-induced *in vivo* leucocytes mobilisation into the mice peritoneal fluid was significantly ($p<0.05$) increased by ME at 250 and 500 mg kg^{-1}. The total leucocytes counts were higher in the extract-treated groups when compared to the control group. The mobilised white blood cells were predominantly polymorphonuclear neutrophils (PMNs). The ME administered (orally) at 5000 mg kg^{-1} did not caused lethality and signs of acute intoxication after 48 h observation period. The results of this study have established cellular and humoral

immunomodulatory activities of *G. kola* extract and justify further investigations into the effects of specific constituents of the plant on immune system components. *(International Journal of Pharmacology 3 (4): 347-351, 2007;* ***doi:*** *10.3923/ijp.2007.347.351)*

Evaluation of Immunomodulatory Activity of *Clerodendrum phlomidis* and *Premna integrifolia* Root

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Roots of *Clerodendrum phlomidis* Linn. f. suppl. and *Premna integrifolia* Linn. Mant. (*Verbanacea*) are known under the common name Arni/Agnimantha. Roots of both the plants are important rasayana drugs and are considered to be useful in the treatment of variety of ailments. Roots of either of these two plants are incorporated as Arni/Agnimantha in many valued and popular Ayurvedic formulations. So the present study was aimed at evaluating the two roots for their immunomodulatory potential. Oral administration of methanol extracts of both the roots (300 mg $kg^{-1} \times 7$ days) in mice prior to immunization with Sheep Red Blood Cells (SRBC) resulted in a significant increase in haemagglutinating antibody titre, plaque forming cell assay and delayed type hypersensitivity to SRBC. *C. phlomidis* showed higher specific immune activity as compared to *P. integrifolia*, *C. phlomidis* and *P. integrifolia* enhanced the non specific immune response in carbon clearance test and showed significant immunoprophylactic effect, when tested on *E. coli* induced abdominal sepsis. In the present study *C. phlomidis* showed higher response to specific immune activity as compared to *P. integrifolia*, where as in case of non specific immune activity both the roots showed almost equal response. *(International Journal of Pharmacology 3 (4): 352-356, 2007;* ***doi:*** *10.3923/ijp.2007.352.356)*

Antipyretic Activity of *Byrsocarpus coccineus* Schum and Thonn. (Connaraceae)

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The aqueous leaf extract of *Byrsocarpus coccineus* Schum and Thonn. (Connaraceae) was investigated for antipyretic activity in rats and rabbits using yeast, amphetamine and lipopolysaccharide induced pyrexia models. In control rats, yeast (10 mL kg^{-1}, s.c.) caused elevation of rectal temperature of 1.68°C 19 h after administration. The extract (100, 200 and 400 mg kg^{-1}, p.o.) produced a significant ($p<0.05$) dose dependent inhibition of temperature elevation. Peak

inhibitory effect was observed at 1 h post therapy (42.05, 47.16 and 63.64% inhibition, respectively for the extract at 100, 200 and 400 mg kg^{-1}). The effect at 400 mg kg^{-1} was greater than that of acetylsalicylic acid, ASA (100 mg kg^{-1}, p.o.; 43.18%). An elevation in rectal temperature of 1.88°C was provoked in control rats by amphetamine (10 mg kg^{-1}, i.p.) 0.5 h after administration while in control rabbits, lipopolysaccharide from *E. coli* (0.2 μg kg^{-1}, i.v.) elicited an elevation of 1.11°C, 1.5 h post challenge. In both models, the extract produced a significant ($p<0.05$) dose and time dependent direct reduction of elevated temperature with peak effect observed at 3.5 h post therapy. Percent reduction of fever values were 50.24, 61.11 and 84.33, respectively for the extract at 100, 200 and 400 mg kg^{-1} (p.o.) in respect of the amphetamine test. The effect at 400 mg kg^{-1} was about the same as that of ASA (85.31%) in this case, but it was lower (44.90%) compared to the standard drug (96.64%) in the lipopolysaccharide test. The results obtained in this study suggest that the extract possess antipyretic activity. *(International Journal of Pharmacology 3 (4): 357-361, 2007; **doi:** 10.3923/ijp.2007.357.361)*

Hepatoprotective Effect of the Ethanolic Extract of *Urtica parviflora* Roxb. in CCl_4 Treated Rats

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The ethanolic extract of leaves of *Urtica parviflora* (EEUP) was evaluated for the hepato protective effect in carbon tetrachloride (CCl_4) induced hepatotoxicity in rats to prove its ethnomedicinal claim by the hill people of Sikkim. Hepatotoxicity was induced in Swiss Albino male rats of Sprague Dawley strain by subcutaneous injection of carbon tetrachloride at the dose of 1 mL kg^{-1} body weight. The hepatoprotective activity was evaluated by the assay of liver function biochemical parameters such as aspartate aminotransaminase (AST), alanine aminotransaminase (ALT), alkaline phosphatase (ALP), total bilirubin, serum protein and by study of histopathology of the livers. The toxic effect of carbon tetrachloride was controlled significantly by the EEUP at 250, 500 and 700 mg kg^{-1} p.o. ($p<0.05$) as compared to the CCl_4 treated animals by restoration of the levels of serum bilirubin, proteins and hepato protective enzymes. Histopathological studies revealed that the centrolobular necrosis induced by CCl_4 was recovered to normal state by EEUP in a dose dependent manner. The study confirms the possible hepatoprotective potentiality of the ethanolic extract of leaves of *Urtica parviflora* which had been collected from Sikkim. Studies are under process to isolate and characterize the bioactive component present in the

plant as well as to establish the mechanism of action underlying for its hepatoprotective potentiality. *(International Journal of Pharmacology 3 (4): 362-366, 2007; **doi**: 10.3923/ijp.2007.362.366)*

Effects of Ephedrine on the Onset of Neuromuscular Block and Hemodynamic Responses Following Priming by Atracurium

Sussan Soltanimohammadi and Mirsadegh Seyedi

In a double blinded study, seventy ASA I and II patients, undergoing elective surgery under general anesthesia were randomized into two equal groups. In both groups, 2 μg kg^{-1} fentanyl was injected as premedication. Anesthesia was induced by 1.5 mg kg^{-1} of propofol and subsequently was maintained with a propofol infusion at a rate of 8 mg kg^{-1} h^{-1}. After control-TOF obtained and recorded by accelerometer, priming dose of atracurium 0.05 mg kg^{-1} was injected intravenously and 2.5 min later, intubating dose of atracurium 0.5 mg kg^{-1} with 140 μg kg^{-1} ephedrine in study group or equal volume of the saline in control group were injected. When TOF ratio became zero, patients tracheas were intubated. Variables were noted as: heart rate and blood pressure as baseline, 1, 3, 5 min after induction and one minute after intubation and onset time of atracurium when TOF ratio became zero. Data were analyzed by Independent sample t-test, Chi-square, Mann-Whitney U-test and Repeated measures ANOVA. $p<0.05$ was considered statistically significant. Onset time of atracurium for intubation was shorter in ephedrine group ($p = 0.0001$). The baseline values of Mean Arterial Pressure (MAP) and Heart Rate (HR) did not differ between the two groups. HR and MAP at first and third minutes after induction were lower than baseline in each group ($p = 0.0001$). There was significant statistical (not clinical) difference in mean HRs between the two groups ($p = 0.003$). The difference of mean MAPs was not statistically significant between the two groups ($p = 0.213$). Ephedrine, accelerated the onset time of atracurium in priming technique, with minimal hemodynamic effects. *(International Journal of Pharmacology 3 (4): 367-370, 2007; **doi**: 10.3923/ijp.2007.367.370)*

In vitro Antisickling Activity of Anthocyanins from *Ocimum basilicum* L. (Lamiaceae)

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Some Congolese plant extracts have recently shown an interesting antisickling activity. Four aqueous and ethanolic extracts from two plants *Cymbopogon*

citratus (DC) Staff and *Ocimum basilicum* L. were evaluated for their antisickling activity. Only *O. basilicum* L. was found to be active. Anthocyanins crude extract of the leaves of *O. basilicum* exhibited attractive antisickling activity, thus, supporting the claims of the traditional healers and suggesting a possible correlation between the chemical composition of these plants and their uses in traditional medicine. *(International Journal of Pharmacology 3 (4): 371-374, 2007; **doi:** 10.3923/ijp.2007.371.374)*

Protective Effect of Turmeric, *Ginkgo biloba*, Silymarin Separately or in Combination, on Iron-Induced Oxidative Stress and Lipid Peroxidation in Rats

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The present study is designed to investigate the protection conferred by dietary supplementation of turmeric, *Ginkgo biloba* extract, silymarin separately or in combination in comparison to vitamin E against iron-induced oxidative stress. We, also, studied the effect of these agents on the activities of cytosolic and (m) EH hydrolase as well as GST. Results revealed that exposing the rats to iron overload 6 h before decapitation caused a significant rise in hepatic and plasma TBARS by 1200 and 166%, respectively. This was associated with depletion in blood lysate GSH (59%) and significant induction of hepatic and erythrocyte SOD; hepatic CAT (186.6%); GST (118%), (s)EH (122.8%) and (m)EH (295%) as compared to normal control group. Pretreatment with turmeric caused a significant repletion of blood lysate GSH levels and a significant rise in hepatic SOD. Also, it counteracted the rise in plasma TBARS levels, erythrocyte SOD and (s)EH caused by iron. In comparison to iron-loaded rats, pretreatment with Egb caused a significant rise in liver cytosol SOD, blood CAT and (s)EH, while silymarin caused a significant reduction in hepatic TBARS, SOD and CAT with significant increase in blood GSH and CAT. Combination group counteracted the effect of iron on blood GSH and SOD; hepatic CAT and GST. Accordingly, we suggest that turmeric, silymarin, ginkgo might be useful herbal remedies to suppress oxidative damage caused by iron overload and emphasize the additive effect of the dietary antioxidants. *(International Journal of Pharmacology 3 (5): 375-384, 2007; **doi:** 10.3923/ijp.2007.375.384)*

Cardioprotective Effect of *Bacopa monneira* Against Isoproterenol-Induced Myocardial Necrosis in Rats

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The effects of standardized hydro-alcoholic lyophilized extract of *Bacopa monneira* (Bm) in isoproterenol (ISP)-induced myocardial necrosis were studied. Wistar albino male rats were randomly divided to sham, ISP control and *Bacopa monneira* treated groups. *Bacopa monneira* was administered in doses of 50, 100, 150 or 200 mg kg^{-1} orally for 30 days to *Bacopa monneira* treated groups while sham and ISP control groups received saline orally for the same duration. On day 29 and 30, ISP (85 mg kg^{-1}) was administered subcutaneously at an interval of 24 h to ISP control and *Bacopa monneira* treated groups. On day 31, hemodynamic parameters were recorded before all rats were sacrificed. Hearts were excised and processed for biochemical, histopathological and ultrastructural assessment. Significant cardiac dysfunction, decline in endogenous antioxidant defence [superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GSHPx) and reduced glutathione (GSH)], myocyte specific injury markers [myocardial lactate dehydrogenase (LDH) and creatine kinase-MB (CK-MB) isoenzyme] as well as increase in lipid peroxidation marker [malonaldialdehyde (MDA)] were observed in ISP control group as compared to sham control. Of the different doses studied, *Bacopa monneira* (150 mg kg^{-1}) produced maximum cardioprotection as evidenced by significant restoration of endogenous antioxidants, myocardial LDH and CK-MB isoenzyme activities and decrease in MDA. Histopathological and ultrastructural findings also reconfirmed the cardioprotective effect of the extract. The significance of these results is discussed in relation to cardioprotective effects of *Bacopa monneira* against ISP-induced cardiotoxicity. *(International Journal of Pharmacology 3 (5): 385-392, 2007;* ***doi:*** *10.3923/ijp.2007.385.392)*

Toxicological Assessment of Methanolic Stem Bark and Leaf Extracts of *Entada africana* Guill. and Perr., Mimosaceae

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This study was aimed to assess the possible toxic effects of *Entada africana*, a widely used African medicinal plant. The acute toxicity of the methanolic stem bark and leaf extracts of *Entada africana* Guill. and Perr., (Mimosaceae) was assessed on mice. It revealed an average toxicity with a LD_{50} of 146.7 and

249.9 mg kg^{-1} body weight for stem barks and leaves, respectively. The extracts showed no cytotoxicity against KB and Vero cells. Sub-chronic toxicity was assessed in rabbits, which received orally, daily for a month, a dose corresponding to 10% of the LD_{50}. Compared to the control group this dose caused no significant ($p>0.05$) modification of haematological and biochemical parameters, total cholesterol, urea, creatinine and aspartate amino-transferase (AST). The extracts lowered serum glucose significantly ($p<0.05$) by 52% at first two weeks of treatment. The stem bark and leaf extracts showed temporary decrease ($p<0.05$) of Alanine amino transferase (ALT) by 26.1 and 39.1%, respectively. The stem bark extracts increased triglycerides significantly ($p<0.01$) by 108% at the end of last week of treatment. These investigations seemed to indicate the safety ob sub-chronic oral administration (up to 14.67 and 24.9 mg kg^{-1} body weight) of the methanolic extracts of *Entada africana* in rabbits. *(International Journal of Pharmacology 3 (5): 393-399, 2007;* ***doi:*** *10.3923/ijp.2007.393.399)*

Investigation of Some *Piper* Species for Anti-Bacterial and Anti-Inflammatory Property

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Methanol extracts of *Piper longum* L., *Piper betle* L., *Piper attanuatum* Buch-Ham. [type-2], *Piper hymenophyllum* Miq., *Piper sarmentosum* Roxb., *Piper argyrophyllum* L., *Piper attanuatum* Buch.-Ham. [type-1] and *Piper chaba* Hunter were checked for their antibacterial efficiency against 15 clinically important bacterial strains. Cefotaxime sodium (100 μg $disc^{-1}$) was used as standard. Crude leaf powder suspensions of these 8 *Piper* species were also evaluated for acute and chronic anti-inflammatory study at a dose of 300 mg kg^{-1}. Diclofenac sodium was used as the standard drug. Carrageenan and dextran models were studied for acute inflammation while cotton pellet-induced granuloma was used for chronic inflammation study. ANOVA followed by Dunnett's t-test were employed for statistical analysis. Piper species showed better anti-inflammatory activity than antibacterial activity. *Piper sarmentosum*, *Piper argyrophyllum*, *Piper longum*, *Piper betle* and *Piper chaba* has biologically important properties and they should be further explored and the active principle should be elucidated in order to bring out the promising antibacterial and anti-inflammatory agent. *(International Journal of Pharmacology 3 (5): 400-405, 2007;* ***doi:*** *10.3923/ijp.2007.400.405)*

Effect of Heroin Used in Iran on Male Fertility of Mice

Fazelipour Simin and Tootian Zahra

The aim of this study, was to determining the effects of the heroin used in Iran that there has been no study on this subject on fertility indices in mice (Balb/c); These factors include sperm motility, sperm viability, daily sperm production, epididymal sperm reserve, serum testosterone concentration, body weight, testis weight and gonado-somatic index. For this study a total number of 177 mice (105 male and 72 female) were used. The male mice were divided into 5 groups (3 control and 2 experimental). From each group 3 male were chosen for fertility rate. Different experimental groups of heroin-dependant mice (50 mg kg^{-1} IP for 3 days, twice daily), were divided into two groups. One of which received heroin with a dose of 5 mg kg^{-1}, IP and the other 5 mg mL^{-1}, IP twice daily for a period of 40 days. The Results showed that the heroin used in Iran could exert a significant effect on the sperm motility, sperm viability and serum testosterone concentration; Also significant changes in the body weight, testis weight and fertility were observed; But no significant changes in the daily sperm production, epididymal sperm reserve and gonado-somatic index were seen. The data suggests that the heroin used in Iran could affect some of the spermatogenesis functions. *(International Journal of Pharmacology 3 (5): 406-410, 2007;* ***doi:*** *10.3923/ijp.2007.406.410)*

The Effect of Multivitamin-Haematinic Complex on Chloramphenicol-Induced Anaemia in Rabbits

A.B. Saba and A.A. Oyagbemi

A study on the haemotoxic effect of orally administered chloramphenicol palmitate (CAP) and the possible countering effect of multivitamin-haematinic complex (MVH) on chloramphenicol-induced anaemia was conducted using rabbits as the animal model. Twenty male rabbits were used in this study. They were randomly divided into four groups of five rabbits each according to the drug administered. Rabbits in group A were administered with 0.9% physiological saline; group B rabbits were administered with chloramphenicol only while rabbits in group C were given combination of chloramphenicol and MVH. Rabbits in group D were administered with MVH only. Chloramphenicol palmitate was administered at dosage of 50 mg kg^{-1}, 6 h interval per day for a period of three weeks. Chemiron® was the source of multivitamin-haematinics used in this study and 5 mL of the syrup was administered thrice daily for the same period of time. All the administration of drugs was done orally. Blood samples were collected from

the rabbits in all the groups on the 7th, 14th and 21st of drug administration. Peripheral blood parameters such as the Red Blood Cell count (RBC), Packed Cell Volume (PCV), haemoglobin concentration (Hb), Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin Concentration (MCHC), Mean Corpuscular Haemoglobin (MCH) and White Blood Cell count (WBC) were evaluated. The haemotoxic effect of CAP was evident from the 7th day to the 21st day of drug administration with the lowered haematological values of rabbits in group B when compared with those of the rabbits in control group A. Statistical comparison shows that the differences of the means of group A and B were significant for RBC ($p<0.01$), PCV ($p<0.05$) and Hb ($p<0.05$) on day 7; for RBC ($p<0.001$), PCV ($p<0.001$) and Hb ($p<0.01$) on day 14; for RBC ($p<0.001$), PCV ($p<0.001$) and Hb ($p<0.05$) day 21. The administration of MVH to the rabbits in group D produced higher mean haematological values for the group compared with the mean values of the control group A and these changes were only significant for RBC ($p<0.05$), PCV ($p<0.05$) and MCH ($p<0.05$) on day 21. The rabbits of group C administered with MVH and CAP exhibited significantly lower levels of PCV ($p<0.05$) on day 7, RBC ($p<0.01$) PCV ($p<0.01$) and Hb ($p<0.05$) on day 14 relative to the values obtained in the control group A. This study further confirmed the anaemic side effect of chloramphenicol and it also established the limitations of haematopoietic micronutrients in reducing or ameliorating this anaemic effect especially during prolonged administration of chloramphenicol. *(International Journal of Pharmacology 3 (5): 411-415, 2007; **doi**: 10.3923/ijp.2007.411.415)*

Antistress, Adoptogenic and Immunopotentiating Activity Roots of *Boerhaavia diffusa* in Mice

Meera Sumanth and S.S. Mustafa

Ethanolic extract of roots of *Boerhaavia diffusa* was evaluated for antistress, adoptogenic activity in albino mice, by swim endurance test and cold restrain stress. The extract improved the stress tolerance by significantly increasing the swim duration and reducing the elevated WBC, blood glucose and plasma cartisol. Immunomodulatory activity was evaluated by carbon clearance assay and delayed hypersensitivity test. The extract significantly increased carbon clearance, indicating the stimulation of reticuloendothelial system. The extract produced an increase in DTH response to SRBC in mice, which was comparable with that of Levamisol, indicating stimulatory effects on lymphocytes and accessory cell types required for the expression of reaction. *(International Journal of Pharmacology 3 (5): 416-420, 2007; **doi**: 10.3923/ijp.2007.416.420)*

Effect of Formaldehyde Injection in Mice on Testis Function

Tootian Zahra, Tajik Parviz, Fazelipour Simin and Taghva Mehdi

The medical use of formaldehyde has focused especially on laboratory use. Harmful effects of formaldehyde injection, such as testicular tissue, are quite well documented. However, detailed studies of the effects of formaldehyde on testis functions are quite limited. For this study a total number of 150 mice (60 male and 90 female) were used. Five groups of male mice (n = 6) were subjected to intra peritoneal treatment of formaldehyde daily at doses of 0, 2.5, 5, 7.5 and 10 mg kg^{-1} body weight in a period of 40 days. From each group 3 male mice were chosen for fertility rate. The results showed that the formaldehyde could exert a significant effect on body weight, gonado-somatic-index, fertility, motility and viability of sperm in all treated groups, but no significant decline of serum testosterone concentration, daily sperm production and testis weight were observed in the same groups. The data suggest that the formaldehyde could affect some of the testis function. *(**Published in:** International Journal of Pharmacology 3 (5): 421-424, 2007; **doi:** 10.3923/ijp.2007.421.424)*

The Additional Effect of Magnesium Sulfate to Lidocaine in Spinal Anesthesia for Cesarean Section

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Different additives have been used to prolong spinal anesthesia. We designed a prospective, randomized, double-blind study to evaluate the effect of spinal anesthesia. Eighty patients scheduled for first cesarean surgery were randomly allocated into 2 groups to receive either 1.5 mL lidocaine 5% with 0.5 mL sterile water (control group, n = 40) or 1.5 mL lidocaine 5% with 0.5 mL preservative-free magnesium sulfate 10% (magnesium group, n = 40). Neither epinephrine nor opioid was added to the treatment mixture. The duration of analgesia after spinal anesthesia (the time from local anesthetic injection to the first opioid request) and the duration of analgesia after surgery (the time between termination of the procedure and the time at which the first dose opioid was requested) were compared. The durations of analgesia after spinal anesthesia was significantly longer in the magnesium (160.8±49.1) than in the control group (113.3±27.3) and the durations of analgesia after surgery was significantly longer in the magnesium (74.5±47.5) than in the control group (26.6±25.1), (p = 0.001). There was no associated increase in adverse events in the group receiving intrathecal magnesium. *(International Journal of Pharmacology 3 (5): 425-427, 2007; **doi:** 10.3923/ijp.2007.425.427)*

In vitro Antistaphylococcal Activity of the Extracts of Several Neglected Plants in Malaysia

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The present study was carried out to evaluate the antibacterial activity of the aqueous, methanol and chloroform extracts of several plants available in Malaysia, namely *Muntingia calabura* (L.), *Melastoma malabathricum* (L.), *Bauhinia purpurea* (L.), *Corchorus capsularis* (L.) and *Dicranopteris linearis* (L.) using the single screening *in vitro* microtiter plate dilution methods. The extracts, at the dose of 5 μg μL^{-1}, were screened against various strains of *Staphylococcus aureus*, namely *S. aureus* 29213α, *S. aureus* 33591, *S. aureus* 700699, vancomycin-intermediate *S. aureus* (VISA) and vancomycin-resistant *S. aureus* (VRSA). Results: Interestingly, only the methanol extracts of *D. linearis* exhibited an antibacterial activity against all strains of *S. aureus* whereas all extracts of *M. calabura* were effective only against the *S. aureus* 29213α, *S. aureus* 33591 and *S. aureus* 700699. The Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) for *D. linearis* range between 0.625-1.250 and 1.250-2.500 μg μL^{-1}, respectively whereas for the *M. calabura* extracts the MIC and MBC range between 1.250-5.000 and 2.500-5.000 μg μL^{-1}, respectively. Although the other plants gave negative results in this study, their potential antibacterial properties should not be disregarded as the present study was carried out using only one low concentration (5 μg μL^{-1}) and that the activity was determined using crude, but not pure, extracts. The present study demonstrated the potential of chloroform extract of *D. linearis*, which indicate the present of non-polar bioactive compounds, as VRSA antibacterial agents and all extracts of *M. calabura* as a potential source of antibacterial agents for the treatment of normal *S. aureus* infection. *(International Journal of Pharmacology 3 (5): 428-431, 2007;* ***doi:*** *10.3923/ijp.2007.428.431)*

Anticonvulsant Effects of Aqueous Extract of *Glycyrrhiza glabra* Root in PTZ-Induced Seizure in Mice

M. Nassiri-Asl, S. Saroukhani and F. Zamansoltani

In this study, anticonvulsant effects of aqueous extract of *G. glabra* were investigated in mice. *G. glabra* extract, diazepam and normal saline were injected intraperitoneally at 50-300 mg kg^{-1}, 0.5-1 mg kg^{-1} and 10 mL kg^{-1}, respectively, 30 min before pentylenetetrazole (90 mg kg^{-1}, i.p.). Aqueous extract at a dose of

300 mg kg^{-1} delayed the onset time of the seizure and decreased the duration of seizure significantly compared to the control. The duration of seizure was also significantly decreased at doses 60-200 mg kg^{-1}. In conclusion, the aqueous extract of glycyrrhiza root possesses anticonvulsant activities which may be effective in the management of petit mal seizure. *(International Journal of Pharmacology 3 (5): 432-434, 2007;* ***doi:*** *10.3923/ijp.2007.432.434)*

Evaluation of Cytotoxic Effect of *Teucrium polium* on a New Glioblastoma Multiforme Cell Line (REYF-1) Using MTT and Soft Agar Clonogenic Assays

Hossein Eskandary, Saeed Rajabalian, Touraj Yazdi, Mohammad Eskandari, Khadijeh Fatehi and Narges Ashraf Ganjooei

In the present study we evaluated the *in vitro* cytotoxic activity of aqueous and methanolic extract of *T. polium*. In order to evaluate, first we established a new glioblastoma multiforme cell line, which was designated as REYF-1 cell. Cytotoxic activity of the extracts was evaluated on this cell line using both MTT assay and clonogenic cell assay. Present results show that methanolic extract of *T. polium* exhibits dose dependant cytotoxic effect. The IC50 values of methanolic extract were 95 and 69 μg mL^{-1} using MTT assay and Clonogenic assay, respectively. The IC50 for aqueous extract was 1400 μg mL^{-1}. These findings show a cytotoxic activity of *T. polium* methanolic extract on glioblastoma multiforme cells *in vitro*. Further studies need to be done to find out the active compound(s) of this plant as a cytotoxic agent. *(International Journal of Pharmacology 3 (5): 435-437, 2007;* ***doi:*** *10.3923/ijp.2007.435.437)*

Studies on Antagonistic Action of Methanolic Extract of *Ledebouria ovaltifolia* on Isolated Rat Stomach Strip and Rabbit Jejenum Preparations

Peter I. Aziba

The inhibitory and analgesic effects of aqueous extract of *Ledebouria ovaltifolia* has been reported in a previous study. In the present study, the effects of methanolic root extract was examined on Ach-induced contractions in Rat Stomach Strip (RSS) and on the pendular movement of Rabbit jejenum in order to examine the time and pattern of antagonistic action of the extract in these muscles. The action of the extract on Ach-induced contractions was non

competitive, since maximum contractions were suppressed and right wand shift of the curve. As extract concentration increases, a pronounced time dependent inhibition was observed. In the isolated rabbit pendular movement, the inhibitory action of the extract mimicked Adrenaline like effect in the gut. These results show that *L. ovaltifolia* possesses, antispasmodic actions similar to that of biological amines. *(International Journal of Pharmacology 3 (5): 438-440, 2007; **doi:** 10.3923/ijp.2007.438.4440)*

Effects of Oral Clonidine in Preventing Postoperative Shivering After General Anesthesia

Sussan Soltani Mohammadi and Mirsadegh Seyedi

This randomized controlled study was performed to evaluate the efficacy of oral clonidine; an α 2-agonists which augments the inhibiting control of preoptic anterior hypothalamic region on the shivering center, before operation compared with placebo, in preventing postoperative shivering. Eighty ASA I and II patients, undergoing elective abdominal surgery under general anesthesia were randomized into two equal groups. Thirty minutes before anesthesia, patients were given either 0.2 mg oral clonidine (study group, n = 40) or placebo (control group, n = 40) as premedication. Patients were anesthetized with the same technique and drugs. Demographic and perioperative data, the incidence and severity of shivering were recorded in the recovery room. Data were analyzed to evaluate the effects of clonidine on the incidence and severity of postoperative shivering. Demographic and perioperative data were not significantly different between the two groups but emergence time was longer in clonidine group ($p = 0.04$). The incidence of postoperative shivering was 32.5% (13/40) in clonidine and 70% (28/40) in placebo group. The severity of shivering was significantly less frequent in the clonidine compared with placebo group ($p<0.001$). Oral clonidine in dose of 0.2 mg as premedication 30 min before surgery, reduced the incidence and severity of postoperative shivering but increased emergence time. *(International Journal of Pharmacology 3 (5): 441-443, 2007; **doi:** 10.3923/ijp.2007.441.443)*

Hypoglycemic and Hypolipidemic Effect of *Aegle marmelos* (L.) Leaf Extract on Streptozotocin Induced Diabetic Mice

Bhavna Sharma, Santosh K. Satapathi and Partha Roy

The aim of this present study was to determine the probable mechanism of action of *Aegle marmelos* plant leaf extract on streptozotocin induced diabetic mice for

the treatment of diabetes mellitus. Once the diabetic condition was achieved after injecting the mice with 60 mg kg^{-1} body weight (b.wt.) of streptozotocin, the mice were treated for another 15 days with aqueous extract of leaves. Data showed that 300 mg kg^{-1} b.wt. of extract was most effective in reverting the diabetic mice to normal condition. Different biochemical parameters like glucose tolerance test, lipid profile, glycogen biosynthesis, glucose uptake, differential regulation of glucose homeostatic enzymes like glucose-6-phosphatase, hexokinase and insulin release *in vitro*, clearly demonstrated the hypoglycemic effect in treated animals. The data showed that this plant's leaf extract has a remarkable hypoglycemic and hypolipidemic effects. Further study is needed to isolate the active principles from this plant and understand its molecular mechanism of action. *(International Journal of Pharmacology 3 (6): 444-452, 2007;* ***doi:*** *10.3923/ijp.2007.444.452)*

Polymorphic Sites (1236 and 3435) in Multi Drug Resistance Gene 1 Influencing Drug Response in Breast Cancer Patients

Shaswati Khan, Kaiser Jamil, G. Prabhavathy Das, Ch. Mohana Vamsy and Sudha Murthy

This investigation analyzed the occurrences of polymorphisms (SNPs) in MDR1 gene at exon 12 (C1236T) and 26 (C3435T) individually and in combination in breast cancer patients and determined their possible associations to adjuvant chemotherapy. The study group included hundred primary invasive ductal carcinoma patients who subsequently received chemotherapy (the regimen generally consisted of commonly used drugs like adriamycin, cyclophosphamide, 5-fluorouracil and docetaxal and their combinations). Blood samples from 100 healthy individuals used as controls were also genotyped for the MDR1 gene. This investigation revealed a statistically significant correlation with response to various regimens of adjuvant chemotherapy showing a low response to therapy with CT/TT genotype at (exon 12) 1236 codon ($p<0.001$) and favorable response to therapy with CT/TT genotype (exon 26) at 3435 codon ($p<0.001$). The combined effect of both the exons, i.e., mutant exon 12 and wildtype 26 gave poor response, whereas the combination of mutated exon 26 and wildtype exon 12 gave favorable response to chemotherapy ($p<0.0005$). These findings demonstrate for the first time that polymorphisms in exon 12 and 26 of the MDR1 gene greatly influence the variations in drug response in patients. *(International Journal of Pharmacology 3 (6): 453-460, 2007;* ***doi:*** *10.3923/ijp.2007.453.460)*

Gastro-Protective Properties of the Leaf Extracts of *Ocimum gratissimum* L. Against Experimental Ulcers in Rat

P.A. Akah, Lucy John-Africa and C.S. Nworu

Methanol leaf extract of *Ocimum gratissimum* L. (Lamiaceae) was investigated for gastroprotective properties. The anti-ulcer effect was evaluated in three experimental ulcer models induced by ethanol, indomethacin and hypothermic-restraint stress in rats. Anti-ulcer related properties of the extract such as gastrointestinal transit and the activity on isolated gut tissue preparations of guinea pig and rabbit were also determined. The extract (ME) administered orally at doses of 200, 400 and 800 mg kg^{-1} significantly ($p<0.05$) reduced the ulcer indices in a dose-related manner. The extract showed higher gastroprotection against indomethacin and ethanol-induced ulcers than the stress-induced ulcer. Gastrointestinal motility was significantly ($p<0.05$) reduced by the extract in mice. On the rabbit jejunum, ME produced a concentration-dependent relaxation and inhibited ACh contractile responses. The extract, ME had no effect on guinea-pig ileum but inhibited the c ontractions produced by histamine. At doses above 3 g kg^{-1} (p.o.), ME caused no signs of acute toxicity or deaths in mice. Flavonoids, tannins, saponins, carbohydrate, steroids, alkaloids, terpenes and volatile oils were found present in the methanol extract of *O. gratissimum* leaf. The results show that the methanol leaf extract of *O. gratissimum* offers protection against ulcers induced by different ulcerogens and could justify the folk use of the plant in peptic ulcer diseases. Cyto-protection and antispasmodic activities may be the likely mechanisms for the anti-ulcer property of this plant. *(International Journal of Pharmacology 3 (6): 461-467, 2007;* ***doi:*** *10.3923/ijp.2007.461.467)*

Anti-Cariogenic Properties of Malvidin-3,5-Diglucoside Isolated from *Alcea longipedicellata* Against Oral Bacteria

Babak Esmaeelian, Yousef Yari Kamrani, Mohammad Ali Amoozegar, Sanaz Rahmani, Mohammad Rahimi and Massoud Amanlou

The aim of this study was to investigate the anti-cariogenic effects of the indigenous Iranian medicinal plant *Alcea longipedicellata* (Malvaceae), to inhibit the growth and acid production of *Streptococcus mutans* and other cariogenic bacteria involved in dental plaque. The growth inhibitory activity of the ethanol and chloroform extracts were tested against *S. mutans*, *S. salivarious*, *S. sobrinus* and *S. sanguis*. From an ethanol extract of *A. longipedicellata* flowers, malvidin-

3,5-diglucoside (malvin) was identified as a principal constituents which was responsible for antibacterial activity of extract. The malvin showed bacteriocidal activity, while ethanol and chloroform extracts was bacteriostatic. The MIC value of the malvin was 0.16-0.22 mg mL^{-1}. *In vitro* studies had shown that 0.1% malvin could inhibit strongly acid-producing ability of *S. mutans* and salivary glycolysis up to 2 h post rinsing and reduced total bacterial counts of saliva up to 40% 3 h post rinsing. 0.1% malvin was about 60% effective in inhibiting bacterial adherence, as shown by the low weight of accumulated *S. mutans* plaque to glass surface. In conclusion, the anti-acidogenic effect of *A. longipedicellata* suggests that this material could be a useful source for the development of promising anti-cariogenic agents and led to use for pharmaceutical preparations such as mouth rinse. *(International Journal of Pharmacology 3 (6): 468-474, 2007;* ***doi:*** *10.3923/ijp.2007.468.474)*

The Antibiotic Potency of Amoxicillin-Clavulanate Co-Crystal

Ilma Nugrahani, Sukmadjaja Asyarie, Sundani Nurono Soewandhi and Slamet Ibrahim

The antibiotic activity related to compositions of amoxicillin-clavulanate co-crystals heated compare to the physical mixtures against non-betalactam bacteria: *Sarcina lutea* sp. has been studied. Amoxicillin trihydrate-potassium clavulanate were mixed in molar ratios: 0:10; 1:9; 2:8; until to 10:0 and heated at 50°C along 30 min. Inhibition diameters of the co-crystals were compared to amoxicillin heated and inhibition diameters of the physical mixtures were compared to amoxicillin raw material as counterparts. The results showed the tendency of increasing potency of the co-crystals in molar ratios 3:7-3:7 with significantly improvement at molar ratios 4:6; 6:4; 8:2 and 9:1 which proved different profile from the physical mixture. *(International Journal of Pharmacology 3 (6): 475-481, 2007;* ***doi:*** *10.3923/ijp.2007.475.481)*

Anti Oxidative Stress Potential of Cinnamon (*Cinnamomum zeylanicum*) in Operating Room Personnel; A Before/After Cross Sectional Clinical Trial

Akram Ranjbar, Sara Ghaseminejhad, Hassan Takalu, Akram Baiaty, Fatemeh Rahimi and Mohammad Abdollahi

Regarding role of oxidative stress in operating room personnel and the anti oxidative stress potential of *Cinnamon zeylanicum* (cinnamon) in healthy subjects,

the present study aimed to examine anti oxidative stress potential of cinnamon in operating room personnel. A group of 18 operating room personnel was invited to drink cinnamon (100 mg/300 mL tea) once daily for 10 days. Blood samples were obtained before and after entering the study and plasma was measured for oxidative stress biomarkers including Lipid Peroxidation Level (LPO), Total Antioxidant Power (TAP) and Total Thiol Molecules (TTM). Treatment of subjects with cinnamon induced a significant reduction in plasma LPO (5.03±2.01 vs. 3.25±1.32 nmol mL^{-1}, $p = 0.016$). No statistically significant alteration was found for plasma TAP (1.24±0.12 vs. 1.28±0.12, $p>0.05$) and TTM (0.78±0.05 vs. 0.82±0.03, $p>0.05$) after 10 days treatment by cinnamon. In conclusion, reduction of cellular LPO by cinnamon as a dietary supplement can be a rational protocol to control source of hazards in operating room personnel. *(International Journal of Pharmacology 3 (6): 482-486, 2007;* ***doi:*** *10.3923/ijp.2007.482.486)*

The Hypolipidemic Effects of *Artemisia sieberi* (*A. herba-alba*) in Alloxan Induced Diabetic Rats

Kamal Mansi, Masalmeh Amneh and Hamzah Nasr

The present study was designed to evaluate the antidiabetic and hypolipidemic effects of aqueous extract of *Artemisia sieberi* aerial part in normal and alloxan diabetic rats. Forty male Wister rats with body weight of 180-200 g divided into four groups two control and two experimental groups: Group 1-injected with physiological saline, group 2-received orally water extract of *Artemisia sieberi* (39 g kg^{-1} b.wt.) and served as control. Groups 3 and 4 including diabetic rats, group 3 received 10 mL kg^{-1} tap water and served as control and group 5 given orally water extract of *Artemisia sieberi* (0.39 g kg^{-1} b.wt.). At the end of the experimental period (14 days), animals in all four groups were fasted for 12 h and blood samples were taken for the determination of serum glucose total cholesterol, triglycerides, HDL cholesterol, LDL cholesterol and total cholesterol/HDL cholesterol (TC/HDL-C). The treatment was given for 2 weeks. After the treatment a significant reduction was observed in fasting serum glucose levels in the treated diabetic's rats. *Artemisia sieberi* treatment showed considerable lowering of serum total cholesterol, triglycerides, LDL cholesterol, TC/HDL-C and an increase in HDL cholesterol in the treated diabetic group. These results suggest that the oral administration of *Artemisia sieberi* aqueous extract of the aerial part possesses antidiabetic and hypolipidemic effects in alloxan-induced diabetic rats. *(International Journal of Pharmacology 3 (6): 487-491, 2007;* ***doi:*** *10.3923/ijp.2007.487.491)*

Effect of Calcium Chloride on Cyclophosphamide-Induced Genotoxic and Biochemical Changes in Swiss Albino Mice

A.M. Aleisa

The present study was conducted to investigate the effect of calcium chloride on cyclophosphamide (CP)-induced genotoxicity and biochemical changes. The experimental protocol included oral treatment of mice with different doses (50, 100 and 200 mg/kg/day) of calcium chloride for 7 days. Some mice in each group were injected i.p. with CP (100 mg kg^{-1}). In each case animals were killed, 24 h after the last treatment and femurs was excised for cytological studies by micronucleus test. Liver from each mouse was excised and preserved at -70°C for estimation of proteins, nucleic acids, malondialdehyde (MDA) and Nonprotein Sulphydryl (NP-SH) groups. The results obtained revealed that pretreatment with calcium chloride (i) reduced the CP-induced increase in the frequency of micronuclei without any alteration in its cytotoxicity and (ii) protected against the CP-induced increase of MDA and decrease of DNA and NP-SH. The exact mechanism of action is not known, however; the inhibition of CP-induced clastogenicity and lipid peroxidation by calcium chloride may be attributed to the antioxidant action of the latter. Present results demonstrate that calcium chloride might be useful to avert secondary tumor risk by decreasing the accumulation of free radicals and inhibition of mutagenicity. *(International Journal of Pharmacology 3 (6): 492-498, 2007;* ***doi:*** *10.3923/ijp.2007.492.498)*

Assessment of Antifungal Activity of Some Medicinal Plants

Ravindra B. Malabadi and S. Vijay Kumar

This study reports for the first time the antifungal activities of acetone, hexane, dichloromethane and methanol leaf extracts of four plant species (*Acacia pennata*, *Anaphalis wightiana*, *Capparis pepiaria* and *Catunaregum spinosea*) from Belgaum district of Karnataka state, India. The antifungal activities were determined against pathogens (*Candida albicans*, *Kluyeromyces polysporous*, *Aspergillus niger*, *Aspergillus fumigatus*) representing yeasts, moulds and non-thermal dimorphic fungi. MIC values were determined by checking the growth after 24 and 48 h to determine the antifungal activity against the tested pathogens. Highest antifungal activity was observed with methanolic extracts of *Anaphalis wightiana* against all the tested pathogens with the MIC values ranging from 0.02 to 0.06. Methanolic extracts of *Acacia pennata*, *Anaphalis wightiana*, *Capparis pepiaria* have very strong antifungal activity against tested pathogens particularly

C. albicans and *K. polysporus*. The overall results provide promising baseline information for the potential use of the crude extract of leaf in the treatment of fungal infections. An attempt has been made to highlight the promising plant species for further investigation as leads for new drug development. *(International Journal of Pharmacology 3 (6): 499-504, 2007;* ***doi:*** *10.3923/ijp.2007.499.502)*

Evaluation of Hypoglycemic Activity of Glycosides and Alkaloids Extracts of *Picralima nitida* Stapf (Apocynaceae) Seed

J.M. Okonta and C.N. Aguwa

The blood glucose lowering effect of the seed extract of *Picralima nitida* has been suggested to be due to its rich indole alkaloids; this study, therefore, is aimed at evaluating the hypoglycemic activity of the alkaloids and glycosides extracts of the *Picralima nitida* seed. The alkaloids extract of *Picralima nitida* seed (Apocynaceae) given i.p. caused increase in mean fasting blood glucose levels while the glycosides extract reduced the blood glucose levels in normoglycemic and hyperglycemic rats. Glycosides extract caused significant ($p<0.05$) percentage maximal reduction of 38.6% (250 mg kg^{-1}) and 22.9% (500 mg kg^{-1}) of the mean fasting blood glucose levels in normoglycemic and 64.4% (250 mg kg^{-1}) and 39.0% (500 mg kg^{-1}) in the hyperglycemic rats. The glycosides extract maintained low mean fasting blood glucose levels throughout the 24 h duration of study in hyperglycemic rats. On subchronic treatment of hyperglycemic rats, glycosides extract (250 mg kg^{-1}) caused 82.99% while glyburide (5 mg kg^{-1}) caused 60.81% reduction of mean blood glucose levels. Thus the hypoglycemic activity of seed extract of *Picralima nitida* may be resident in the glycosides of the seed extract. *(International Journal of Pharmacology 3 (6): 505-509, 2007;* ***doi:*** *10.3923/ijp.2007.503.509)*

On the Anti Oxidative Stress Potential of *Zataria multiflora* Boiss (*Avishan shirazi*) in Rats

Mona Babaie, Narguess Yasa, Azadeh Mohammadirad, Reza Khorasani and Mohammad Abdollahi

The present study was undertaken to explore the antioxidants effects of *Zataria multiflora* Boiss in rats. Antioxidant activity was measured by inhibition of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical, Total Antioxidant Power (TAP) and Thiobarbituric Acid Reactive Substances (TBARS) in serum of treated rats. Rats

received methanolic extract of *Z. multiflora* by intragastric intubation at doses of 50, 100 and 200 mg kg^{-1} daily for 14 consecutive days. The acute toxicity test (LD_{50}) demonstrated that *Z. multiflora* is not lethal up to a dose of 2000 mg kg^{-1} after oral administration. Treatment of rats with *Z. multiflora* extract showed significant antioxidant activity in the DPPH test as compared to the control. *Z. multiflora* at doses of 50 and 100 mg kg^{-1} significantly increased TAP and decreased TBARS as compared to the control. Administration of *Z. multiflora* at a dose of 200 mg kg^{-1} per day did not significantly alter serum DPPH, TAP and TBARS. Antioxidant activities of *Z. multiflora* at doses of 50 and 100 mg kg^{-1} were in all experiments comparable to that of α-tocopherol. Further studies are needed to elucidate whether *Z. multiflora* as herbal medicine could be useful in the management of human diseases resulting from oxidative stress. *(International Journal of Pharmacology 3 (6): 510-514, 2007;* ***doi:*** *10.3923/ijp.2007.510.514)*

Chronic Administration of *Tribulus terrestris* Linn. Extract Improves Cardiac Function and Attenuates Myocardial Infarction in Rats

Shreesh K. Ojha, Mukesh Nandave, Sachin Arora, Rajeev Narang, Amit K. Dinda and Dharamvir Singh Arya

The present study was undertaken to evaluate the cardioprotective potential of hydro-alcoholic extract of *Tribulus terrestris* Linn. (Family; Zygophyllaceae), a traditional medicine used in Indian and Chinese systems of medicine. Wistar male albino rats weighing 150-200 g were randomly divided into three main experimental groups; sham (saline treated only), isoproterenol (ISP) control (saline and ISP) and *Tribulus terrestris* treatment groups (*T. terrestris* and ISP). Saline or *T. terrestris* extract 250 mg kg^{-1} once daily were orally administered for 30 days. Isoproterenol was administered in rats to induce myocardial infarction. On days 29 and 30, the animals of ISP control and *T. terrestris* treatment group were administered ISP (85 mg kg^{-1}, subcutaneously) at an interval of 24 h. On the day 31, 48 h after first dose of ISP, hemodynamic parameters were recorded. After sacrificing the animals the hearts were excised and subjected to biochemical, histopathological and ultrastructural studies. ISP-administration produced a significant decrease in the activities of endogenous antioxidant defence enzymes viz. superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GSHPx) and tissue antioxidant, reduced glutathione (GSH) along with a concomitant increase in the lipid peroxidation product malonaldehyde (MDA). In addition, a significant decrease in the activities of

myocardial injury markers i.e., creatine phosphokinase-MB (CK-MB isoenzyme) and lactate dehydrogenase (LDH) was also observed in the heart of ISP control group as compared to sham control. Cardiac dysfunction was observed as a decrease in mean arterial pressure (MAP), heart rate (HR), left ventricular rate of peak positive and negative pressure change {(+) and (-) LV dP/dt} and elevated left ventricular end diastolic pressure (LVEDP) following ISP administration. These functional alterations were supported by severe modifications in histopathological and ultrastructural assessment. Pretreatment with *T. terrestris* resulted in the increased activities of SOD, CAT, GSHPx and prevention of depletion of tissue glutathione along with inhibition of lipid peroxidation. In addition treatment with *T. terrestris* decreased the leakage of CK-MB and LDH enzymes from myocardium, there was a significant improvement in cardiac function as evidenced by correction of MAP, HR, LVEDP and contractility and relaxation. The possible underlying mechanism of the cardioprotective effect of *T. terrestris* could be due to restoration of endogenous myocardial antioxidant status or free radical scavenging activity along with correction of the altered hemodynamic parameters and preservation of histoarchitectural and ultrastructural alterations. *(International Journal of Pharmacology 4 (1): 1-10, 2008;* ***doi:*** *10.3923/ijp.2008.1.10)*

Effects of Angiotensin II and Captopril on Morphine Self-Administration and Withdrawal Signs in Rats

Hojjat Allah Alaei, Mahmoud Hosseini, Alireza Sarkaki, Nasser Vahdati-Mashhadian and Asieh Naderi

The aim of this study was to investigate the effects of Ang II and captopril on altering the motivational aspects during the initiation of morphine self-administration. Male Wistar rats were first trained to receive small pellets of food by pressing the active lever in self-administration apparatus. They were anaesthetized with Ketamine and their jugular vein was cannulated. The stainless steel cannula was also inserted into the right brain ventricle and fixed with dental cement. After recovery, the animals were divided into 4 groups (saline, morphine, captopril and Ang II) and placed in self-administration apparatus and allowed to self-administer morphine (1.7 mmol per infusion all test groups) or saline (saline group) during 11 consecutive days for 2 h/sessions. Captopril (300 mmol) and Ang II (1 nmol) injected (i.c.v.) in the corresponding groups before each session. The number of active and passive levers pressed in each group was recorded. After the last session, morphine withdrawal signs were recorded following naloxone injection. In morphine group, the number of active lever pressing was significantly higher than passive one in all 11 days ($p<0.01$) and was also

significantly higher than the saline group in the final three days ($p<0.05$). In captopril group, there were no significant differences between the number of active and passive lever pressings during free access to food (last 5 days). However, the number of active lever pressing was significantly lower than morphine group ($p<0.05$). Some of the withdrawal signs decreased and increased significantly in captopril and Ang II groups, respectively. This study implies the interaction between captopril and opioid system. *(International Journal of Pharmacology 4 (1): 11-19, 2008; **doi:** 10.3923/ijp.2008.11.19)*

Anxiogenic Effects of an Aqueous Crude Extract of *Cryptolepis sanguinolenta* (Periplocaceae) in Mice

Charles Ansah, Evans A.A. Mfoafo, Eric Woode and Mahama Duwiejua

We studied the behavioural effects of the aqueous extract of *Cryptolepis sanguinolenta* (cryptolepis) in mice based on findings of a sedative action of cryptolepis in the pentobarbitone-induced sleeping-time model and the reported traditional use in the management of insomnia. Cryptolepis (100, 300 and 1000 mg kg^{-1}, p.o) was evaluated in the elevated plus maze, open field and the hole board. We assessed entries and the time spent in the two arms of the elevated plus maze, entries and the time spent in the centre, periphery and corners of the open field and head-dipping behavior in the hole board. Cryptolepis (100, 300 and 1000 mg kg^{-1}) significantly ($p<0.05$) increased the time spent in the closed arms of the elevated plus-maze, increased the time spent ($p<0.001$) in the corners of the open field apparatus and decreased head-dipping ($p<0.01$) behaviour in the hole board. The effects of cryptolepis were similar to that of caffeine used as a reference anxiogenic but completely opposite to that of diazepam, a typical anxiolytic. Present findings indicate that cryptolepis has an anxiogenic-like effect in mice. *(International Journal of Pharmacology 4 (1): 20-26, 2008; **doi:** 10.3923/ijp.2008.20.26)*

Study of the Effects of Polyethylene Glycol Sorbitan Esters Surfactants Group on Biological Membranes

Gholamreza Dehghan Noudeh, Payam Khazaeli and Pedram Rahmani

The aim of this study is the evaluation of the effect of one group of surfactants including polyethylene glycol sorbitan esters (Tweens: 20, 40, 60 and 80) on Red Blood Cells (RBC) as a model for biological membranes. Also in this study some of physicochemical properties including Emulsification index (E_{24}) and Foam producing activity (F_h) were studied. In this study the hemolytic effect of four

surfactants from Tween category were evaluated. Surfactants solutions were prepared in McIvan's buffer in specific concentration. 0.2 mL of RBC was mixed with 0.2 mL of one of surfactants solution incubated in four different temperatures for two different times. The absorbance of the samples was determined by UV spectrophotometer. Each test was done nine times. The results were shown by mean±SD. E_{24} and F_h were also determined for each surfactant solutions. In comparison of the four studied surfactants, Tween 20 have the highest hemolytic effect and the Tween 80 is the lowest one. The values of E_{24} and F_h have good correlation with Hydrophilic-Lipophilic Balance (HLB) values. Increasing in HLB value lead to increasing in those parameters. *(International Journal of Pharmacology 4 (1): 27-33, 2008;* ***doi:*** *10.3923/ijp.2008.27.33)*

The Role of Beta-Adrenergic System on the Enhancement of Spatial Learning Caused by Glucose Injection in Young Male Rats

A.A. Moazedi, M. Belaran, A. Hemmaty and A. Rasekh

This study was designed to evaluate the role of beta-adrenergic system on the enhancement of spatial learning caused by glucose injection in the Y-maze. Young male Wistar rats were given daily injections of glucose (500 mg kg^{-1}, i.p.) 10 min before training, propranolol (20 mg kg^{-1}, s.c.) 30 min before training and co-administration of glucose (500 mg kg^{-1}) and propranolol (20 mg kg^{-1}). Three sham groups were received saline at the same volume and conditions. Comparison between co-administration of glucose and propranolol and glucose groups, showed a significant differences at first ($p<0.01$), third ($p<0.001$), fourth ($p<0.01$) and fifth ($p<0.001$) days. Indeed, co-administration of glucose and propranolol caused impairment of spatial learning. There was no significant difference between propranolol and co-administered groups. These findings indicate that propranolol impairs improvement of spatial learning caused by glucose administration via blockade of beta-adrenergic receptors and thus it seems that glucose exerts its memory enhancing effects via beta-adrenergic receptors. *(International Journal of Pharmacology 4 (1): 34-39, 2008;* ***doi:*** *10.3923/ijp.2008.34.39)*

Effect of Vitamin A on Weight-Loss and Haematotoxicity Associated with Gasoline Vapours Exposure in Wistar Rats

F.E. Uboh, M.I. Akpanabiatu, I.J. Atangwho, P.E. Ebong and I.B. Umoh

The effect of vitamin A on weight-loss, growth-depression and haematotoxicity associated with gasoline vapours exposure was assessed in male and female

Wistar albino rats. The rats were exposed to ungraded concentrations of gasoline vapours (6 h daily) for 20 weeks. Vitamin A (retinol) at prophylactic dosage (400 IU kg^{-1} day^{-1}) was orally administered to the rats in the last two weeks of exposure. The levels of haemoglobin (Hb), haematocrit or Packed Cell Volume (PCV), Red Blood Cells (RBC), weight gain and growth rate in the male and female rats exposed to the vapours were significantly lower ($p<0.05$) compared respectively to the levels obtained for male and female control rats. On the other hand, the levels of White Blood Cells (WBC) in the male and female test rats were significantly higher ($p<0.05$) compared respectively with the level obtained for male and female control rats. These observations indicated that exposure to gasoline vapours produced haematotoxicity, weight loss and growth depression in rats. However, administration of vitamin A was observed to produce a significant regain ($p<0.05$) in weight-loss, growth-depression and haematotoxicity observed to be associated with exposure to gasoline vapours, although the females were noted to respond more favourably than the males. This suggests that vitamin A may be used to reverse or prevent weight-loss, growth-depression and haematotoxicity in subjects exposed to gasoline vapours. *(International Journal of Pharmacology 4 (1): 40-45, 2008;* ***doi:*** *10.3923/ijp.2008.40.45)*

Xenoderm Versus `Conventional` Treatment in Pediatrics Burns

Seyed Nejat Hosseini, Seyed Nouraddin Mousavinasab, Haleh Rahmanpour and Alireza Shoghli

The aim of this study was to compare the outcome of Xenoderm (biologic dressing) and `conventional` treatments (Silver sulfadiazine) in pediatrics' burns in our burn center, which is the only burn center in Zanjan province. In this non-randomized clinical trial, 86 burned pediatrics were investigated. The patients were divided into two groups. Those in the `conventional` group (n = 35) did not accepted to enter in Xenoderm group and the second group (n = 51) accepted to enter in to Xenoderm group. Mortality rates in the `conventional` group were 5 (14.3%) and no death were in the Xenoderm group. The median of number of dressing in the `conventional` group and Xenoderm group were 10 and 3 ($p = 0.0005$), respectively. In 20 to 39% Total Body Surface Area (TBSA), the median of first admission hospital stay in the `conventional` group and Xenoderm group were 20 and 7.5 ($p = 0.001$), respectively. In conclusion, the results indicate that Xenoderm dressings offer a lower mortality, hospital stay and dressing exchange in pediatrics burns. A randomized clinical trial that compares the number of operations, albumin intake and scar formation in pediatric burns is warranted. *(International Journal of Pharmacology 4 (1): 46-50, 2008;* ***doi:*** *10.3923/ijp.2008.46.50)*

Analgesic and Anti-Inflammatory Effects of Ethanolic Root Extract of *Hippocratea africana*

Jude E. Okokon, Bassey S. Antia and Emem Umoh

The ethanolic root extract of *Hippocratea africana* (200-600 mg kg^{-1}) was evaluated for analgesic, anti-inflammatory and antipyretic properties. The extract dose dependently inhibited acetic acid-induced writhing, formalin-induced paw licking and thermally -induced pain in mice. The extract also inhibited fresh egg albumin, carrageenin and xylene-induced inflammation in mice. These inhibitions were statistically significant ($p<0.05$) when compared to control. The roots extracts was also found to reduce pyrexia in rats. The analgesic, anti-inflammatory and antipyretic activities of the extract may be related to its active constituents such as tannins, saponins, steroid and flavonoids. *(International Journal of Pharmacology 4 (1): 51-55, 2008;* ***doi:*** *10.3923/ijp.2008.51.55)*

A Coumarin from *Ageratum* Leaves (*Ageratum conyzoides* L.)

Gunawan Pamudji Widodo, Elin Yulinah Sukandar, Sukrasno and I. Ketut Adnyana

The aim of study was to isolate, characterize and elucidate of the antifungal compounds from acetone fraction of *Ageratum* leaves and to determine the antifungal activity of the isolated compounds. A coumarin compound has been isolated from acetone fraction of *Ageratum* leaves (*Ageratum conyzoides* L.) and chemical structure has been elucidated based on UV, IR, NMR and mass spectra. This compound showed an antifungal activity against the plant pathogenic fungi, *Aspergillus niger*. *A. niger* is a fungus and one of the most common species of the genus *Aspergillus*. It causes black mold on certain fruits and vegetables such as grape, onion and peanuts and is a common contaminant of food. The coumarin was tested for its antifungal activity against *A. niger* by disk diffusion method. The MIC values of coumarin was 62.5 μg mL^{-1}. *(International Journal of Pharmacology 4 (1): 56-59, 2008;* ***doi:*** *10.3923/ijp.2008.59.59)*

Prophylactic Effect of Grapefruit Juice Against *Plasmodium berghei berghei* Infection in Mice

A.I. Oreagba, O.O. Aina, O. Awodele, S.O. Olayemi, A.F.B. Mabadeje and R.B. Ashorobi

Grapefruit juice was assessed for chemoprophylactic activity against Chloroquine-sensitive *Plasmodium berghei berghei* infection in mice. A standard inoculum of 1×106 infected erythrocytes was used to assess the prophylactic effect of grapefruit juice (15 mL kg^{-1}) and this was compared with the prophylactic effect of high dose Ascorbic acid (150 mg mL^{-1} or 2.25 g kg^{-1}). The result of the experiment showed that grapefruit juice and high dose vitamin C significantly delayed the establishment of parasitaemia compared with the control group. Furthermore, grapefruit juice and ascorbic acid prolonged the mean survival time of the mice with corresponding decreases in mean peak percentage parasitaemia, respectively. Grapefruit juice however demonstrated a stronger chemoprophylactic activity than ascorbic acid ($p<0.05$). These effects were however lower than the standard prophylactic drug (Pyrimethamine-1.2 mg kg^{-1}). Regular intake of grape juice may protect against malaria infection. Further studies are necessary to elucidate possible mechanisms involved. *(International Journal of Pharmacology 4 (1): 60-63, 2008; **doi:** 10.3923/ijp.2008.60.63)*

A Simplistic Individualization Method for 6-Mercaptopurine in Acute Lymphoblastic Leukemia Children

Ganping Zhou, Zuofu Cai, Shedian Zhou, Zhichun Feng and Feng Xu

The aim of this study was set up a simplistic but low-cost method for 6-mercaptopurine (6-MP) individualization chemotherapy for Acute Lymphoblastic Leukemia (ALL) children in developing China. The blood samples of ten ALL children with 6-MP chemotherapy were collected in the morning on 7th day and 14th day of the onset of therapy respectively and 6-thioguanine nucleotides (6-TGN) levels in Red Blood Cell (RBC) were measured by RP-HPLC (reverse phase-high performance liquid chromatography). Meanwhile on 14th day and 21st day the blood samples of ten ALL children were collected in the morning respectively and determined White Blood Cell (WBC) counts to monitor myelotoxicity. The ideal target level range of 6-TGN was set up between 275~750 pmol/8×10^8 RBC. If the level of 6-TGN in the sample of 7th day was more than 1000 pmol/8×10^8 RBC, the 6-MP dose starting since 8th day was adjusted to 50% of the original dose. If the level of 6-TGN in the sample of 7th day was more than 750 pmol/8×10^8 RBC, the 6-MP dose starting since 8th day was adjusted to 60% of the original dose. The results showed that the 6-TGN levels in ten ALL children ranged from 264~866 pmol/8×10^8 RBC in the samples of 7th day. Among them only two children had high levels of 6-TGN more than 750 pmol/8×10^8 RBC who showed after-effect myelotoxicity with low WBC on 14th day. After the adjustment of 6-MP dose since 8th day, ten ALL children had

6-TGN levels ranging from 270~450 pmol/8×10^8 RBC and no one had a high level of 6-TGN on 14th day. On 21st day ten ALL children had normal WBC counts and showed no myelotoxicity. We concluded that the 6-MP dose adjustment by 6-TGN levels is a simplistic but low-cost individualized method for 6-MP chemotherapy in ALL children in developing China. *(International Journal of Pharmacology 4 (1): 64-66, 2008;* ***doi:*** *10.3923/ijp.2008.64.66)*

An Evaluation of Toxicity and Mutagenicity of *Sphenocentrum jollyanum*

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This study was designed to evaluate the toxicity of *S. jollyanum* using Fischer 344 male rats and the genotoxic effect of the alcoholic extract of the roots. In experiment 1, haematological, serum biochemical and histopathological parameters were determined after 30, 60 and 90 days of oral administration. Experiment 2 involved determinations of total hepatic cytochrome P-450 content. Pentobarbitone induced sleeping times was measured in experiment 3. These are indices of organ specific toxicity or potential for drug interactions. The mutagenic potential was assessed by reverse mutation test using *Salmonella typhimurium* TA_{97}, TA_{98}, TA_{100} and TA_{102} tester strains in experiment 4. There were no significant differences found in most of the hematological, serum biochemical parameters and organ/body weight ratio. No abnormality of any organ was found during histopathological examination and no mutagenicity evidence was detected in any of the mutagenic tests. It, however, caused a significant increase in cytochrome P-450 which correlates well with the decreased pentobarbitone induced sleeping times. The results showed that the no-observed adverse-effect level (NOAEL) of *S. jollyanum* extract (SJE) was >1000 mg kg^{-1} body weight per day in rats, which can be regarded as virtually non-toxic. In conclusion, SJE had no overt organ specific toxicity but demonstrates a potential for drug interactions via cytochrome P-450-mediated metabolism in the rat. *(International Journal of Pharmacology 4 (2): 67-77, 2008;* ***doi:*** *10.3923/ijp.2008.67.77)*

Cardioprotective Effect of *Ficus hispida* Linn. on Cyclophosphamide Provoked Oxidative Myocardial Injury in a Rat Model

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The current communication was designed to assess the cardioprotective effect of the methanolic leaf extract of *Ficus hispida* Linn. (FH) (400 mg kg^{-1} body weight, administered orally for 10 days) on cyclophosphamide (CP) provoked oxidative injury in rat heart. CP cardiotoxicity, induced by single intraperitoneal injection (200 mg kg^{-1} b.wt.), was revealed by elevated serum creatine phosphokinase (CPK), lactate dehydrogenase (LDH), aspartate transaminase (AST) and alanine transaminase (ALT). CP induced rats, treated with FH depicted near normalcy in these parameters. In the CP group, increased oxidative stress was evidenced by a significant rise in myocardial malondialdehyde (MDA) level and decline in superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione reductase (GR), glutathione-S-transferase (GST) and reduced glutathione (GSH) activities in the heart tissue. FH treated rats displayed a significant inhibition of lipid peroxidation (LPO) and augmentation of endogenous antioxidants. These results give credence to the notion that treatment with *F. hispida* leaf extract ameliorates CP induced cardiotoxicity and might serve as a novel combination therapy with CP to combat oxidative stress-mediated myocardial injury. *(International Journal of Pharmacology 4 (2): 78-87, 2008;* ***doi:*** *10.3923/ijp.2008.78.87)*

Studies on Antipyretic-Analgesic and Ulcerogenic Activity of Polyherbal Preparation in Rats and Mice

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The aqueous extract of polyherbal Ayurvedic preparation PD-10 (from the roots of *Hemidesmus indicus* R. Br. (Asclepiadaceae), *Rubia cordifolia* L. (Rubiaceae), *Cissampelos pareira* L. (Menispermaceae); fruits of *Terminalia chebula* Retz. (Combretaceae), *Emblica officinalis* Gaertn. (Euphorbiaceae), *Terminalia bellirica* Roxb. (Combretaceae), *Vitis vinifera* L. (Vitaceae), *Grewia asiatica* L. (Tiliaceae), *Salvadora persica* L. (Salvadoraceae) and granules of *Saccharum officinarum* L. (Poaceae)) was investigated for antipyretic property. The extract caused significant ($p<0.05$) antipyretic activity induced pyrexia by using Brewer's yeast in rats. The evaluation of analgesic activity of PD-10 using acetic acid induced writhing model, hot plate method and tail immersion methods in mice revealed very significant ($p<0.01$) analgesic activity. The ulcerogenicity effect of PD-10 studied at different dosages by Barret's method in rats showed significantly lesser ulcer effect even at very high dosage as compared to that of aspirin. These data confirm the antipyretic, analgesic and ulcerogenic properties of the polyherbal Ayurvedic preparation (PD-10) as enunciated in the traditional texts. *(International Journal of Pharmacology 4 (2): 88-94, 2008;* ***doi:*** *10.3923/ijp.2008.88.94)*

Biological Activity of Chemical Constituents Isolated from *Streptomyces* sp. Tc052, an Endophyte in *Alpinia galanga*

Thongchai Taechowisan, Nantiya Chuaychot, Srisakul Chanaphat, Asawin Wanbanjob and Yuemao Shen

Some endophytic actinomycetes (120) were isolated from the roots of *Alpinia galanga*. Identification of these endophytes was based on their morphology and amino acid composition of the whole-cell extract. Most isolates were classified as *Streptomyces* sp. (82), with the remainder belonging to *Nocardia* sp. (11), *Microbispora* sp. (3) and *Micromonospora* sp. (2). Eight isolates were unclassified and 14 were lost during subculture. The strain identified as endophytic *Streptomyces* sp. Tc052 strongly inhibited test microorganisms. This endophyte was cultured, the agar was extracted with organic solvent and the extract was purified on a column of silica gel to give a major component, which was identified to be kaempferol, isoscutellarin, umbelliferone and cichoriin on the basis of spectroscopic data. These compounds together with the extract were tested for their antimicrobial activity against bacteria and yeast using micro-dilution methods for the determination of Minimum Inhibitory Concentrations (MIC) and Minimum Microbicidal Concentration (MMC). The MIC values obtained with the crude extract varied from 64-128 μg mL^{-1} against tested microorganisms. All the isolated compounds showed various activities. *(International Journal of Pharmacology 4 (2): 95-101, 2008; **doi**: 10.3923/ijp.2008.95.101)*

The Butanol Extract of *Mitragyna ciliata* Root: Potential as a Trypanocide

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Bioassay guided-fractionation of *Mitragyna ciliata Aubrev* and *Pellegr* (Rubiaceae) ethanolic root extract at 100 mg kg^{-1} in *T. brucei* infected rats indicated that the bioactive constituent reside is present in the butanol fraction (inhibition = 66.61%). *In vitro* investigation of the extract revealed that it had low (25.55%) antioxidative property. Chemical analysis of the active fraction showed that it consists of alkaloids. The extract's fraction had no effect on the heamatological profile of treated rats which remained consistent with the major characteristics of trypanosomiasis-anaemia, leucocytopaenia and thrombocytopaenia. Results of the *in vivo* evaluation of calcium concentration showed a significant difference ($p<0.05$), between the active butanol fraction (2.53 ± 0.036 mmol L^{-1}) and the untreated/infected (17.79 ± 0.034 mmol L^{+}). A correlation existed between calcium concentration and parasiteamia in the active fraction ($r = 0.40$, $p = 0.488$) and the infected/untreated ($r = -0.60$, $p = 0.29$).

These observations suggest that the active agent had an effect on the calcium metabolism in the animals which was deleterious to the parasites. *(International Journal of Pharmacology 4 (2): 102-107, 2008; **doi:** 10.3923/ijp.2008.102.107)*

Expression of COX-1, COX-2, iNOS and p38 in Human Brain with Stroke Lesions

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The expression profile of COX-1, COX-2, iNOS and p38, in both the normal and post-ischemic human brain was studied. Focal cerebral ischemia is associated with a marked inflammatory reaction that contributes to the evolution and progression of brain tissue injury. Studies employing anti-inflammatory compounds and transgenic mouse models have suggested that both cyclooxygenase-2 (COX-2) and inducible nitric oxide synthase (iNOS) mediate the deleterious effects of ischemic brain injury. A potential role for the mitogen-activated protein kinase (MAPK) p38 in cytokine production following stroke has been hypothesized. In order to evaluate the expression profiles of COX-1, COX-2, iNOS and p38 in normal and post-ischemic human brain, we evaluated the brain tissue from 12 patients with a pathological diagnosis of cerebrovascular disease (CVD) or cerebrovascular accident (CVA) for expression of COX-1, COX-2, p38 and iNOS via immunohistochemistry (IHC) and *in situ* hybridization (ISH). Corresponding brain sections from six normal patients served as controls. COX-1, COX-2 and iNOS were all present in the normal brain. However, in infarcted brains, an increase in iNOS and COX-2 expression was observed, with no concomitant change in COX-1 staining or p38 noted. Our data demonstrate up-regulation of both iNOS and COX-2, but not p38 or COX-1, in infarcted brains, bolstering the hypothesis that iNOS, COX-2 and their reaction products contribute to the progression of post-ischemic cerebral injury via cytotoxic, rather than cerebrovascular mechanisms. *(International Journal of Pharmacology 4 (2): 108-113, 2008; **doi:** 10.3923/ijp.2008.108.113)*

Protective Role of *Tephrosia purpurea* Ethanolic Seed Extract on Glycoprotein Components in Streptozotocin Induced Diabetic Rats

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The aim of the present study was to investigate the beneficial role of *Tephrosia purpurea* ethanolic seed extract on glycoprotein components in streptozotocin induced diabetic rats. Diabetes mellitus was induced in wistar rats by single

intraperitoneal injection of streptozotocin (50 mg kg^{-1} b.wt.) dissolved in 0.1 M citrate buffer (pH 4.5) after overnight fasting for 12 h. Blood glucose and plasma insulin were measured and glycoprotein components (protein bound hexose, protein bound hexosamine, fucose and sialic acid) in plasma, erythrocyte membrane, liver and kidney were investigated in control and experimental animals in each group. Oral administration of TpESet at a dose of 300 mg kg^{-1} b.wt. to diabetic animals for 45 days revert back all the altered biochemical parameters in diabetic animals. The present study thus, indicates that TpESet has potent role in modifying altered glycoprotein components in streptozotocin induced diabetic rats. *(International Journal of Pharmacology 4 (2): 114-119, 2008; **doi:** 10.3923/ijp.2008.114.119)*

Antioxidant Activity of Aqueous Methanol and Ethyl Acetate Extract of Leaves of *Annona senegalensis* Pers from Togo Versus the One Originates from Burkina Faso

Y. Potchoo, I.P. Guissou, M. Lompo, E. Sakiè and B. Yaro

The aim of the present study is to evaluate and compare the antioxidant potential of the leaves extracts of *Annona senegalensis* (Annonaceae) of Togo versus the one of Burkina Faso. To this end, aqueous methanol and ethyl acetate extracts by splitting and by steeping were achieved and the determination of total polyphenols of which flavonoids was carried out. A survey of the antioxidant activity using the DPPH methods was performed. The content in total polyphenol (3.47±0.03%) and flavonoid (2.33±0.17%) of 70% (v/v) aqueous methanol extract of the specimen from Togo was significantly higher than the one from Burkina (2.66±0.08 and 1.64±0.04%, respectively) ($p<0.00001$ for total polyphenol; $p<0.05$ for total flavonoid), whereas, the amount of total flavonoid in the ethyl acetate extract of the species from Burkina (40.38%) was triplicated. For the two types of extracts, the species of Burkina Faso showed an improved antioxidant activity than the one of Togo (IC_{50} = 8.51 and 21.08 μg mL^{-1} versus 12.46 and 29.22 μg mL^{-1}, respectively) ($p<0.05$). These free radicals inhibition activity of the extracts may be due at least to polyphenolic flavonoids identified by means of HPLC assay performed in the preliminary study. These flavonoids were rutin and isoquercetrin as flavanols (specimen from Togo) of which are added epicatechin and catechin derivatives (flavanols) in the specimen from Burkina. The traditional use of plant leaves may imply in part this activity against the free radicals. *(International Journal of Pharmacology 4 (2): 120-124, 2008; **doi:** 10.3923/ijp.2008.120.124)*

Antioxidant Property of Hypersaline Cyanobacteria, *Phormidium tenue* (KMD 33)

A. Nagasathya and N. Thajuddin

The antioxidant property of cyanobacterial isolates was analyzed by physical (bodyweight change and swimming time) and biochemical parameters (superoxidedismutase activity and total reduced glutathione activity) by using swiss mice at Animal House, J.J. College of Arts and Science, Pudukkottai, Tamil Nadu, India. The efficiency of cyanobacterial isolates was determined by comparing with the antioxidant property of *Spirulina* (Commercial grade). The results showed that *Phormidium tenue* (KMD 33) possess significant antioxidant property when compared to other cyanobacterial isolates and *Spirulina* (commercial grade). *(International Journal of Pharmacology 4 (2): 125-129, 2008;* ***doi:*** *10.3923/ijp.2008.125.129)*

Protective Effect of Fresh Radish Juice (*Raphanus sativus* L.) Against Carbon Tetrachloride-Induced Hepatotoxicity

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The fresh juice obtained from the locally grown radish root was tested for possible hepatoprotective effect against carbon tetrachloride-induced hepatocellular damage in albino rats. The juice at two doses of 2 and 4 mL/kg/rat for five consecutive days, exhibited a significant dose-dependent protective effect. The magnitude of protection was measured by using biochemical parameters including determination of Serum glutamate pyruvate transaminase (SGPT), serum glutamate oxaloacetate transaminase (SGOT), alkaline phosphatase (ALP), bilirubin (Bil) and non-protein sulfhydryl content in the liver tissues (NP-SH), in addition to histopathological assessment. The protective effect was demonstrated in lowering the elevated serum levels of SGPT, SGOT, Bil, ALP and increasing NP-SH level. Silymarin, a known hepatoprotective agent was used as a positive control. Biochemical data were further supported by the histopathological results. The phytochemical examination of the fresh juice revealed the presence of sulfurated, phenolic and terpenoid compounds in radish. *(International Journal of Pharmacology 4 (2): 130-134, 2008;* ***doi:*** *10.3923/ijp.2008.130.134)*

Biological Evaluation of Aqueous Herbal Extracts and Stirred Yoghurt Filtrate Mixture Against Alloxan-Induced Oxidative Stress and Diabetes in Rats

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The aim of the present study was to investigate the biological effects of aqueous herbal extracts mixed w ith stirred yoghurt filtrate against alloxan-induced oxidative stress and diabetes in rats. Aqueous extracts of six medicinal plants: fenugreek, greater burdock, goat's rue, colocynth, chicory and lupine were mixed with stirred yoghurt filtrate and used in the experiments. Blood glucose and alanine and aspartate aminotransferase (ALT and AST) activities were estimated before and after alloxan-induced oxidative stress and diabetes in rats. Obtained results showed that blood glucose levels in sera of treated rats fed on aqueous extract of medicinal plants and stirred yoghurt filtrate mixture decreased with mean values of 135.0±26.85 mg/100 mL serum compared with the treated rat fed on basal diet (positive control) with mean value of 237.66±14.43 mg/ 100 mL serum. Data showed that ALT and AST activities in sera of treated rat fed on aqueous extract of medicinal plants and stirred yoghurt filtrate mixture were nearest to the level of un-treated rats fed basal diet (negative control). The means values of ALT and AST level in treated group fed on aqueous extract of medicinal plants and stirred yoghurt filtrate mixture were 57.33±20 and 189.33±48.85 compared with the positive control 90±31.76 and 260.00±57.27 and negative control 44.66±9.5 and 180.66±23.58 U L^{-1}, respectively. Data concluded that mixture of medicinal plant extracts and stirred yoghurt filtrate may play a role in protection against alloxan-induced oxidative stress and diabetes in rat. *(International Journal of Pharmacology 4 (2): 135-139, 2008;* ***doi:*** *10.3923/ijp.2008.135.139)*

Effect of Milling on Solid State Transformation of Sulfamethoxazole

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The purpose of this research was to investigate the influence of milling process on solid state transformation of sulfamethoxazole. Raw material Sulfamethoxazole was obtained from Virchow Lab. India. Milling was carried out by using Retsch Mühle with definite rate and pressure, for 10, 20 and 30 min. The milled samples were characterized by scanning electron microscope, powder X-ray diffraction, Fourier transform Infra Red Spectroscopy and thermal analysis DSC. Raw material

sulfamethoxazole was found to be a form 1. According to SEM analysis, powder X-ray diffraction pattern, FT-IR analysis and thermal analysis, Milling process of form 1 sulfamethoxazole with various milling time didn't caused polymorphic transformation and amorphisation. But the milling can created defect on crystal lattice of sulfamethoxazole form 1. Milling process also reduced the particle size of sulfamethoxazole form 1, but not its crystallinity. The result of this research demonstrates that milling process can produced defect on crystalline solid of sulfamethoxazole form 1. *(International Journal of Pharmacology 4 (2): 140-144, 2008; **doi:** 10.3923/ijp.2008.140.144)*

Phytochemical and Some Neuropharmacological Studies on the Methanolic Leaf Extracts of *Cissus cornifolia* [Vitaceae] in Mice

A.M. Musa, A.H. Yaro, H. Usman, M.G. Magaji and M. Habu

The phytochemical constituents and some neuropharmacological activity of the methanolic leaf extract of *Cissus cornifolia* (Bak.) Planch [Family: Vitaceae] was evaluated in mice employing various models. The preliminary qualitative phytochemical analysis carried out on the methanolic leaf extract of *Cissus cornifolia* revealed the presence of alkaloids, flavonoids, saponins, steroids/terpenoids, stilbenoids and tannins. The neuropharmacological effects of the methanolic leaf extract of *Cissus cornifolia* on CNS were evaluated using diazepam sleeping time, exploratory behaviour (head dip tests), motor coordination and acute toxicity studies in mice. The extract at tested doses (10, 20 40 mg kg^{-1} body weight i.p.) produced reduction in exploratory behaviour (head dip test), beam walking assay (foot slips) and potentiate the diazepam-induced sleep in mice; the LD_{50} was found to be 775.0 mg kg^{-1} body weight i.p. in mice. These results corroborates with the traditional usage of this plant as a remedy against mental derangement as confirmed by the sedative activity expressed by the extract. *(International Journal of Pharmacology 4 (2): 145-148, 2008; **doi:** 10.3923/ijp.2008.145.148)*

Pharmacokinetic Analysis of Warfarin in Iranian Warfarin Sensitive Patients

S. Sadrai, P. Ghadam, R. Sharifian, E. Nematipour, Z. Kianmehr and Sh. Shahriari

In this study, we investigated pharmacokinetic of warfarin in sensitive and control patients by HPLC. The analysis performed by HPLC consisted of

a column (Perfectsil Target, 5 μm, 125×4.0 mm) and an isocratic mobile phase of methanol: acetonitrile: phosphate buffer (pH: 3.5) (7:55:38, v/v), flow rate: 1 mL min^{-1} and UV detection at 270 nm. The assay was linear in warfarin concentration ranges of 0.1-10 μg mL^{-1} ($r^2 = 0.9975$) and with Relative Standard Deviation (RSD) of <8% for inter-day and <6% for intra-day. The mean warfarin blood concentration of 54 patients was 1.2±0.6 μg mL^{-1}. *(International Journal of Pharmacology 4 (2): 149-152, 2008;* ***doi:*** *10.3923/ijp.2008.149.152)*

Comparing Oral Gabapentin Versus Clonidine as Premedication on Early Postoperative Pain, Nausea and Vomiting after General Anesthesia

Sussan Soltani Mohammadi and Mirsadegh Seyedi

This study was designed to compare the effects of small dose of oral gabapentin with clonidine as premedication; on early postoperative pain, nausea and vomiting (PONV) in patients undergoing elective abdominal surgeries under general anesthesia. In a randomized placebo controlled study, 120 ASA I and II patients scheduled for elective abdominal surgeries were randomly assigned to receive either 0.2 mg oral clonidine (n = 40), 300 mg gabapentin (n = 40) or placebo (n = 40) 1 h before surgery. They anesthetized with the same technique. Demographic data, post operative pain scores, nausea and vomiting and total morphine consumption by PCA pump after the operation were recorded in the recovery room and during first 6 h after the operation. VAS score more than 3 points assumed clinically important for postoperative pain management. Demographic data was not statistically different between the study groups. Two patients in gabapentin compared with 13 patients in Clonidine group (p = 0.01) and 29 patients in placebo group (p = 0.014) had VAS >3 in recovery room. The mean morphine consumption were 4.75±7.5 mg in placebo, 1.95±5.51 mg in Clonidine and 1.56±1.5 mg in gabapentin group in recovery (Clonidine vs placebo, p = 0.032; gabapentin vs placebo, p = 0.024; gabapentin vs Clonidine, p = 0.045). These measurements were 18±15.8, 13.1±12.6, 12.1±12.9 mg during first 6 h after operation; in placebo, Clonidine and gabapentin groups, respectively (Clonidine vs placebo, p = 0.017; gabapentin vs placebo, p = 0.023; gabapentin vs Clonidine, p = 0.067). PONV was not statistically different between the study groups in the recovery room and during first 6 h after the operation. This study showed that oral premedication with 300 mg gabapentin reduce postoperative pain and total morphine consumption but not PONV during recovery and first 6 h after abdominal surgeries. *(International Journal of Pharmacology 4 (2): 153-156, 2008;* ***doi:*** *10.3923/ijp.2008.153.156)*

Antibacterial Effects of Iranian *Cuminum cyminum* Essential Oil on Burn Isolates of *Pseudomonas aeruginosa*

N. Hosseini Jazani, M. Zartoshti and S. Shahabi

The aim of this study is the evaluation of the antibacterial activity of cumin essential oil on burn isolates of *P. aeruginosa*. Fifty two burn isolates of *P. aeruginosa* were obtained from burn wards of two hospitals at Tehran, Iran. The susceptibility of isolates was determined usinga broth microdilution method. Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) of isolates to cumin essential oil was determined. The susceptibilities of isolates to different antibiotics were tested using agar disk diffusion method. The rates of resistances were determined to antibiotics as follows: Gentamicin 96%, ceftazidime 100%, tobramycin 100%, kanamycin 100%, amikacin 73%, ceftizoxime 100%, piperacillin 94.2%, imipenem 50% and ciprofloxacin 71%. Cumin essential oils possessed antibacterial effect against all isolates of *P. aeruginosa*, with MIC and MBC values in the range of 0.015 to 0. 25 ml mL^{-1}. These results suggest the potential use of the cumin essential oil for the control of *P. aeruginosa* infections. *(International Journal of Pharmacology 4 (2): 157-159, 2008;* ***doi:*** *10.3923/ijp.2008.157.159)*

Anticancer Activity of Natural Compound (Zerumbone) Extracted from *Zingiber zerumbet* in Human HeLa Cervical Cancer Cells

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A natural compound, zerumbone was extracted, isolated and purified from the rhizomes of edible plant *Zingiber zerumbet* using methanol extraction and Column Chromatography (CC) method. The isolated and purified zerumbone crystals were subjected to High Performance Liquid Chromatography (HPLC), Liquid Chromatography Mass Spectrometry (LCMS) and 13C NMR and 1H NMR analysis to confirm the purity, molecular weight and molecular structure. The study investigated the purified zerumbone crystals for its anti-cancer properties on human cervical cancer cell line (HeLa). Cisplatin, was used as a positive control in this study. The cytotoxicity of zerumbone and cisplatin were investigated using the MTT assay and caspases-3 was estimated with colorimetric assay in zerumbone treated HeLa cells. Morphological analysis showed that there were changes observed on HeLa cancer cells after treatment with zerumbone and cisplatin. The

MTT assay results demonstrated that the IC_{50} value (±SEM) of zerumbone was determined to be 11.3 μM (2.5 μg mL^{-1}) whilst the IC_{50} value of cisplatin was at 7.5 μM (1.6 μg mL^{-1}). Prominent growth retardation was identified to the HeLa cancer cells, after treatment with both compounds, while caspase-3 was observed to be significantly increased in zerumbone treated cells as compared to untreated control cells. This study showed promising avenues towards zerumbone to be developed as a new chemo-natural drug for treatment of cervical cancer. *(International Journal of Pharmacology 4 (3): 160-168, 2008;* ***doi:*** *10.3923/ijp.2008.160.168)*

Chemopreventive Effect of Chlorella on the Antioxidant System in 7, 12-Dimethylbenz[a]Anthracene-Induced Oxidative Stress in Liver

Amr Amin

The present study was designed to evaluate the protective effect of Chlorella against liver oxidative damage induced by oral administration of 7,12-dimethylbenz[a]anthracene (DMBA) to female Wistar rats. Animals of protected groups were orally administered with dried powdered of Chlorella suspended in warm water at two selected doses; 0.5 and 1.0 g kg^{-1} b.wt. Water extract of chlorella tablets (Wakunaga of America Co., Ltd. Mission Viejo, CA, USA) was given to rats two weeks before DMBA administration and was continued for 15 weeks after cancer induction. Administration of DMBA (25 mg/rat) caused a significant increase of lipid and protein oxidations and significantly altered the levels of liver antioxidants. Treatment with chlorella extract has significantly prevented DMBA-induced oxidative changes in liver. Levels of MDA and *P.carbonyl* were significantly reduced after administration of chlorella extract. Chlorella has also restored normal level of indigenous antioxidants such as CAT, GSH, GST and SOD. The present results also show a high antioxidant activity of chlorella extract. It is therefore concluded that due to its potent antioxidant properties, chlorella modulates the DMBA-induced hepatic oxidative stress that is normally associated with induced-breast cancer in rats. *(International Journal of Pharmacology 4 (3): 169-176, 2008;* ***doi:*** *10.3923/ijp.2008.169.176)*

Antigenotoxic Effect of Genistein and Gingerol on Genotoxicity Induced by Norethandrolone and Oxandrolone in Cultured Human Lymphocytes

Tanveer Beg, Yasir Hasan Siddique, Gulshan Ara, Jyoti Gupta and Mohammad Afzal

Norethandrolone and Oxandrolone were studied for their genotoxic effect on human lymphocyte chromosomes using chromosomal aberrations (CAs) and sister chromatid exchanges (SCEs) as parameters and subsequently Genistein and Gingerol were used as antigenotoxic agents to ameliorate the genotoxicity induced by the steroids. This experiment was aimed at finding the dosage at which these two steroids are genotoxic enough to cause chromosome damage. They were studied at 5, 10, 20, 30 and 40 μM, respectively and were found to be significantly genotoxic at 30 and 40 μM. Genistein and Gingerol proved to be equally effective in reducing genotoxic damage at appropriate doses. The results suggest a strong genotoxic effect of both steroids *in vitro* in human lymphocytes and also a significant antigenotoxic action of Genistein and Gingerol against steroid induced genotoxic damage. *(International Journal of Pharmacology 4 (3): 177-183, 2008;* ***doi:*** *10.3923/ijp.2008.177.183)*

Lithium Induces Expression of HCNP and ChAT in the Septo-Hippocampal Cholinergic System of Rats

J.H. Lee, J.Y. Lee, S.B. Yoo and J.W. Jahng

This study was conducted to examine if intraperitoneal lithium at high dose, sufficient to induce conditioned taste aversion learning, increases expression of Hippocampal Cholinergic Neurostimulating Peptide (HCNP) and choline acetyltransferase (ChAT) in the brain septo-hippocampal system. Quantitative real-time RT-PCR analysis demonstrated that an intraperitoneal injection of lithium chloride (0.15 M, 12 mL kg^{-1}) acutely increases HCNP mRNA levels in the hippocampus. ChAT immunoreactivities in the medial septal nucleus and the hippocampus, which were determined by immunohistochemistry and western blot analysis, also increased with intraperitoneal lithium. These results suggest that intraperitoneal lithium may acutely activate the septo-hippocampal cholinergic system, via increasing expression of HCNP and ChAT. Additionally, we suggest that activation of the septo-hippocampal cholinergic system with increased HCNP expression may be a part of lithium's action as unconditioned stimulus in conditioned taste aversion learning. *(International Journal of Pharmacology 4 (3): 184-189, 2008;* ***doi:*** *10.3923/ijp.2008.184.189)*

Evaluation of Antipyretic Effect of a Traditional Polyherbal Preparation: A Double-Blind, Randomized Clinical Trial

M. Gupta, B.P. Shaw and A. Mukherjee

The ancient Ayurvedic text *Charak samhita* of Indian medicine prescribes a specific group of ten plants having antipyretic properties with minimal side-effects. The aqueous extract of polyherbal ayurvedic preparation PD-10 (from the roots of *Hemidesmus indicus* R. Br. (Asclepiadaceae), *Rubia cordifolia* L. (Rubiaceae), *Cissampelos pareira* L. (Menispermaceae), fruits of *Terminalia chebula* Retz. (Combretaceae), *Emblica officinalis* Gaertn. (Euphorbiaceae), *Terminalia bellirica* Roxb. (Combretaceae), *Vitis vinifera* L. (Vitaceae), *Grewia asiatica* L. (Tiliaceae), *Salvadora persica* L. (Salvadoraceae) and granules of *Saccharum officinarum* L. (Poaceae)) exhibited significant antipyretic-analgesic properties during rodent experiments while exhibiting low toxicity and ulcerogenicity. The presence of flavonoids, tannins and polyphenols in this extract prompted this double-blind, randomized clinical trial on 60 patients using Aspirin (60 mg kg^{-1} body weight per day) as the standard drug for comparison. The primary outcome measured was reduction in body temperature, while the secondary outcomes measured were prevalence of associated symptoms of fever and routine blood and urine parameters. A representative sample of patients was also studied for reduction in the level of Prostaglandin (PGE_2). The clinical trial showed that fever was rapidly and substantially reduced after oral administration of PD-10 and this antipyretic effect was more sustained and highly significant ($p<0.001$) when compared to Aspirin. Many associated symptoms of fever also exhibited significant reductions when PD-10 was administered as compared to Aspirin. Prostaglandin levels also registered a substantial decrease during treatment with the test drug. *(International Journal of Pharmacology 4 (3): 190-195, 2008;* ***doi:*** *10.3923/ijp.2008.190.195)*

A Pharmacological Evaluation of A Herbal Cocktail

A.M. Oloyede, J. Okpuzor, O. Omidiji and H.O.C. Mbagwu

An herbal cocktail comprising of seeds, stem and leaves of seven African plants extensively used in South-Western Nigeria for the management and treatment of inflammation and tumor of the breast was investigated for analgesic and anti-inflammation activities. The analgesic properties of the ethanol extract was investigated using three *in vivo* mice test models (mice constriction, hot-plate and formalin-induced pain test) while anti-inflammatory activities of the same were evaluated using the Carageenan and egg albumin-induced oedema test systems *in vivo*. Present findings indicated that the cocktail at a concentration of 400-1600 mg kg^{-1} produced significant inhibition ($p<0.05$) response in both phases of the formalin pain model. The acetic acid-induced abdominal constriction also showed a dose dependent pain

inhibition pattern directly related to the amount of extract administered. Instructively, the extract exhibited higher analgesic activity than acetylsalicylic acid but lower than morphine (2 mg kg^{-1}). The cocktail (400-1600 mg kg^{-1}) exhibited anti-inflammatory activity but inhibition observed at 1600 mg kg^{-1} in the 5 and 6 h was very significant. It compared favourably with the reference drug (Indomethacin 10 mg kg^{-1}). Consequently, it is our suggestion that the cocktail may possess analgesic and anti-inflammatory properties. *(International Journal of Pharmacology 4 (3): 196-201, 2008;* ***doi:*** *10.3923/ijp.2008.196.201)*

MMP-13 Inhibitory Activity of Thirteen Selected Plant Species from Okinawa

Changwei Ao, Anping Li, Abdelnaser A. Elzaawely and Shinkichi Tawata

The methanol extracts of thirteen medicinal plants from Okinawa, Japan were examined for Matrix Metalloproteinase-13 (MMP-13) inhibitory activity. Among the thirteen selected species, *Curcuma longa*, *Ocimum basilicum* and *Curcuma aromatica* showed high inhibitory effect with IC_{50} values of 27.8, 81.7 and 85.8 μg mL^{-1}, respectively. The chemical compositions of these three plant extracts were determined by LC-MS. Curcumin was the predominant constituent of *C. longa* and *C. aromatica* (58.6 and 28.7 mg g^{-1} extract, respectively), whilst *O. basilicum* mainly contained rosmarinic acid with amount of 47.3 mg g^{-1} extract. Both of curcumin and rosmarinic acid exhibited excellent MMP-13 inhibitory activity (IC_{50}: 3.6 and 2.9 μM, respectively). The results indicate that curcumin and rosmarinic acid might be potent MMP-13 natural inhibitors. *(International Journal of Pharmacology 4 (3): 202-207, 2008;* ***doi:*** *10.3923/ijp.2008.202.207)*

Lack of Effect of Atorvastatin or Pravastatin on the Endothelium-Dependent Relaxation in Segments of Human Vessels

Juan Carlos Prieto, Gianni Pinardi, Jaime Zamorano, Ernesto Larrain, Ramiro J. Zepeda, Rodrigo Castillo, Juan Espinoza and Hugo F. Miranda

Segments of radial artery and internal mammary artery were obtained from patients undergoing coronary artery bypass grafts, cut into two segments (≈5 mm in length) and placed in two organ chambers for isometric tension recording. Atorvastatin or pravastatin was added to one chamber and after a 2 h stabilization

period, contractions to a plateau were elicited with 70 mM KCl. Then the rings were precontracted with 10^{-7} M noradrenaline and cumulative relaxation curves to 10^{-9} to 10^{-4} M acetylcholine and sodium nitroprusside (10^{-8} to 10^{-4} M) were then performed. Contraction to KCl was significantly higher in the radial artery than in the internal mammary and the opposite was obtained with NA-induced contractions. In both vessels, statins did not modify the KCl contraction. Atorvastatin reduced the response to NA in the radial artery. The radial artery and the internal mammary artery precontracted with NA, relaxed dose-dependently in response to ACh. The relaxation was significantly higher in the radial than in the internal mammary, both with and without pretreatment with atorvastatin or pravastatin. These findings demonstrate a lack of effect of acute treatment with atorvastatin or pravastatin on the modulation of vascular tone in segments of human radial and internal mammary artery as measured by endothelium-dependent relaxation induced by Ach. *(International Journal of Pharmacology 4 (3): 208-212, 2008; **doi:** 10.3923/ijp.2008.208.212)*

Evaluation of the Hepatoprotective Effect of *Aloe vera, Clematis hirsute*, *Cucumis prophetarum* and Bee Propolis Against Experimentally Induced Liver Injury in Rats

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In a project to search for new natural hepatroprotective agents 3 plant extracts; *Aloe vera*, *Clematis hirsute* and *Cucumis prophetarum*, in addition to Bee Propolis were studied. The ethanol extracts of the 3 plants and propolis were subjected to hepatoprotective assay using Wistar albino rats. Liver injury induced in rats using carbon tetrachloride. The biochemical parameters; serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphatase (ALP) and total bilirubin were estimated as reflection of the liver condition. Based on the good results of the biochemical parameters measurements, histopathological study was performed on the liver of rats treated with Propolis and *Aloe vera*. The livers of rats treated with Propolis showed good protection against the toxic effect of carbon tetrachloride. On the other hand treatment with *Aloe vera* extract failed to restore the normal appearance of hepatocytes. All the results were compared with silymarin, as a reference hepatoprotective drug. *(International Journal of Pharmacology 4 (3): 213-217, 2008; **doi:** 10.3923/ijp.2008.213.217)*

The Analgesic Effect of Intravenous Neostigmine and Transdermal Nitroglycerine Added to Lidocaine on Intravenous

Regional Anesthesia (Bier's Block): A Randomized, Controlled Study in Hand Surgery

Seyed Mojtaba Marashi, Arash Yazdanifard, Gita Shoeibi, Hooman Bakhshandeh and Parin Yazdanifard

This study was conducted to determine whether intravenous neostigmine, Transdermal Nitroglycerine (NTG) and combination of them enhance analgesia from lidocaine in Bier's block. Eighty patients with American Society of Anesthesiologist (ASA) physical statuses 1, 2 scheduled for elective hand surgery were included in the study. Participants were computer randomized to four groups with 20 patients in each group. All patients received Intravenous Regional Anesthesia (IVRA) with 3 mg kg^{-1} 0.5% lidocaine. Neostigmine group (group 1) received IVRA with 0.5 mg neostigmine added to lidocaine. Nitroglycerine (NTG) group (group 2) received transdermal patch comprise of 5 mg NTG (was applied at the proximal forearm) added to lidocaine. NTG-neostigmine group (group 3) received simultaneously neostigmine and transdermal NTG patch in addition to lidocaine. The control group (group 4) received IVRA with 2 mL saline added to lidocaine. A repeated measure analysis of variance (ANOVA) model was used for statistical analysis. Tourniquet pain onset was not significantly different between groups ($p = 0.158$). However there was significant differences in surgical pain onset ($p<0.001$). ANOVA analysis revealed that surgical pain onset was significantly longer in neostigmine group and neostigmine- NTG group in contrast with control group ($p = 0.001$, $p<0.001$, respectively). Severity of pain between groups was not significant before injection, at the time of injection, as well as at 30, 60, 90 and 120 min after injection ($p = 0.123$). Prolonged surgical pain onset in group 1 (neostigmine) and group 3 (NTG and neostigmine) revealed that only neostigmine besides lidocaine in Bier's block have an influencing role to lengthen surgical pain onset however it could not be able to decrease severity of surgical pain in the bier's block. *(International Journal of Pharmacology 4 (3): 218-222, 2008;* ***doi:*** *10.3923/ijp.2008.218.222)*

Comparison in Effect of Intravenous Alfentanil and Lidocaine on Airway-Circulatory Reflexes during Extubation

Mustafa Sadegi, Abolfazl Firozian, Mohammad Hossein Ghafari and Fatemeh Esfehani

This randomized controlled double-blind trial was designed to compare the presence of Airway-Circulatory Reflexes to tracheal extubation in groups

administering IV alfentanil or lidocaine, in 150 patients undergoing cesarean surgery receiving a standardized anesthetic protocol. At the end of surgery, after return of spontaneous ventilation, patients received either alfentanil 15 μg kg^{-1} or lidocaine 1.5 mg kg^{-1}. The presence of cough and it's severity during emergence before extubation was noted. BP and HR were recorded at 2 min after end of surgery (baseline), 2 min after study drug administration and 1 min after extubation. The groups were matched according to age, baseline BP and HR. The incidence of coughing was less frequent in the alfentanil than in the lidocaine group (19% versus 75%, respectively, $p<0.001$). Although the severity of coughing was considerably different between two groups (lower in alfentanil g) but was not statistically different ($p = 0.292$). The mean BP and HR were lower in alfentanil than lidocaine group 2 min after administration and 1 min after extubation ($p<0.001$). The median of delay time (time between the study drug administration and extubation) was 6 min in alfentanil (Range: 4-8) and 5 min in lidocaine groups (Range: 4-8) ($p<0.001$). These results indicate that alfentanil decreases Airway-Circulatory Reflexes more than lidocaine during emergence from anesthesia without clinically important prolonging the time to extubation. *(International Journal of Pharmacology 4 (3): 223-226, 20080;* ***doi:*** *10.3923/ijp.2008.223.226)*

Antioxidant Activity of *Hyptis suaveolens* Poit.

U. Gavani and P.M. Paarakh

The antioxidant activity of the methanol extract of leaves of *Hyptis suaveolens* Poit. was evaluated *in vitro* by 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity using gallic acid and butylated hydroxyanisole (BHA) as reference standards. They exhibited strong antioxidant radical scavenging activity with IC_{50} value of 0.4, 1.15 and 14.04 μg mL^{-1} for Gallic acid, BHA and *Hyptis suaveolens*, respectively. The antioxidant activity of methanol extract could be due to the presence of Flavonoids. *(International Journal of Pharmacology 4 (3): 227-229, 2008;* ***doi:*** *10.3923/ijp.2008.227.229)*

Potential Antimicrobial Activity of Various Extracts of *Bacopa monnieri* (Linn.)

P. Sampathkumar, B. Dheeba, V. Vidhyasagar, T. Arulprakash and R.Vinothkannan

The present study was carried out to evaluate the antimicrobial potential of ethanolic, diethyl ether, ethyl acetate and aqueous extracts of aerial parts of

Bacopa monnieri (L.). The antimicrobial activity of ethanolic, diethyl ether, ethyl acetate tested for the *Staphylococcus aureus*, *Proteus vulgaris*, *Candida albicans* and *Aspergillus niger*. Diethyl ether extracts of *Bacopa monnieri* showed an antibacterial activity against gram positive and ethyl acetate extract was active against gram negative organism. The extract of diethyl ether having potent antimicrobial activity against *Staphylococcus aureus* at higher concentrations 300 μg mL^{-1}). Ethanolic extract of *Bacopa monnieri* has more antifungal activity against *Candida albicans* and *Aspergillus niger*. Diethyl ether extract and Ethyl acetate extract has slight antifungal activity but have broad spectrum of antibacterial effect against the entire tested organisms, whereas ethanolic extract showed marked inhibitory activity against fungal species. Aqueous extract of the different concentration showed no inhibitory effects on the tested microorganisms due to loss of some active compounds during extraction processes of the sample. *(International Journal of Pharmacology 4 (3): 230-232, 2008;* ***doi:*** *10.3923/ijp.2008.230.232)*

Cefixime-Induced Dystonia and Hypothermia in a 12-Year Old Boy: A Need for Safe Prescribing

K.A. Oshikoya and I.O. Senbanjo

This study report a case of adverse reaction to cefixime; a newly promoted drug in Nigeria, manifesting as dystonia and hypothermia in a 12-year old boy. The reaction was delayed, as it occurred after the second dose of the drug. The symptoms abated after cefixime was discontinued without causing any sequelae. Neurotoxicity of cefixime was initially uncommon and not reported during its clinical trial, but in recent time it has emerged and is on the increase, especially in adults with renal failure. The neurotoxicity reported in adults ranged from encephalopathy to coma, which were reversible after discontinuation of the drug. Dystonia and hypothermia had neither been reported in adults nor children following use of cefixime at therapeutic dose or in children with renal failure. This report is, therefore, made to alert health care providers that adverse drug reaction in children is not a rare problem in Nigeria and to highlight the significance of evidence based medicine, safe and rational prescribing in preventing adverse reaction to drugs. *(International Journal of Pharmacology 4 (3): 233-236, 2008;* ***doi:*** *10.3923/ijp.2008.233.236)*

Dose Dependent Activity of *Benincasa hispida* on Colchicine Induced Experimental Rat Model of Alzheimer's Disease

Chandan Roy, T.K. Ghosh and Debjani Guha

The present study focused the dose dependent protective effects of water extract of *Benincasa hispida* (BH) pulp on colchicine induced experimental rat model of Alzheimer's disease (AD). The effect of chronic oral treatment of aqueous pulp extract of BH (400 mg kg^{-1} b.wt.) was studied in Holtzman strain adult albino rats of both sexes. The behaviour study, antioxidant level Superoxide dismutase (SOD), Catalase (CAT), Reduced glutathione level and Lipid peroxidation level were studied in different brain areas such as cerebral cortex (CC), cerebellum (CB), midbrain (MB), caudate nucleus (CN) and pons and medulla (PM) in colchicine induced experimental Alzheimer rat model before and after treatment with BH. Results indicate that chronic treatment with BH at different doses (100, 200, 300, 350, 400 and 450 mg kg^{-1} body weight), BH increased the CAT, SOD, GSH level and the number of correct choices out of 10 daily trials along with decreased latency time (in seconds) and LPO level dose dependently. These changes were statistically significant in some doses not in all doses. The effect of BH was most effective at 400 mg kg^{-1} body weight, compared to other doses on all parameters of different brain parts of colchicine induced Alzheimer's rat model. Antioxidant plays a crucial role in the management of neurodegenarative diseases including Alzheimer's disease. A number of Indian medicinal plants have been used in the traditional system of medicine (Ayurveda) for the management of neurodegenarative diseases including Alzheimer's disease. Some of these plants have already been reported to possess strong antioxidant activity. BH, a fruit of common use, is rich in vit-E, beta-carotene, flavonoids and flavonols. Colchicine produces Reactive Oxygen Species (ROS) by binding with tubulin, which is the structural and functional protein of microtubule and ultimately helps in neurodegeneration leading to experimental AD. The results convey the message that at a dose of 400 mg kg^{-1} body weight BH has protective effect on colchicine induced Alzheimer's disease. *(International Journal of Pharmacology 4 (4): 237-244, 2008;* ***doi:*** *10.3923/ijp.2008.237.244)*

In vivo Antioxidant and Potential Antitumor Activity of Aqueous Ethanol Extract of Leaves of *Senna alata* (L.) Roxb (Ceasalpiniaceae) on Bearing Carcinomatous Cells

C.A. Pieme, V.N. Penlap, B. Nkegoum and J. Ngogang

The study was designed to investigate the subacute toxicity, *in vivo* antioxidant and antitumor activity of aqueous ethanol extract of *Senna alata* on bearing carcinomaous cells. The results of the evaluation of the toxicity on albinos Wistars rats showed no death of rats and the increase of their weight after 26 days of administration of the extract. The liver enzymes activity alanine amino transferase (ALT), aspartate amino transferase (AST) and alkaline phosphatase (ALP) did not varied significantly as well as the concentration of creatinine of the treated rats both in the liver homogenate and serum compare to the control. The study was extended to the evaluation of *in vivo* antitumor activity of extract of *S. alata* on bearing carcinomatous cells on Nude mice. The results showed that after treatment with the extract at 100 and 200 mg kg^{-1} body weight, the levels of MDA decreased significantly (3.44±0.76-1.97±0.48) while the concentration of glutathione and the activities of CAT and SOD increased significantly. The results suggest that the aqueous ethanol extract of *S. alata* is not toxic and exhibits significant antitumor and antioxidant effects on bearing carcinomatous cells. *(International Journal of Pharmacology 4 (4): 245-251, 2008;* ***doi:*** *10.3923/ijp.2008.245.251)*

Gastroprotective and Antioxidant Activities of the Roots of *Hibiscus aculeatus* Roxb in Rats

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Ethanol extract of *Hibiscus aculeatus* (HAE) was assessed in different acute and chronic gastric ulcer models in rats. HAE, 50-200 mg kg^{-1} administered orally, twice daily for 5 days showed dose-dependent ulcer protective effect in pylorus ligation (9.21-52.63% protection, $p<0.05$), aspirin (23.95-56.25% protection, $p<0.05$), ethanol (13.55-58.47% protection, $p<0.05$), cold-restraint stress (18.34-72.92% protection, $p<0.05$ to $p<0.001$) and acetic acid ($p<0.05$ to $p<0.001$) induced acute and chronic ulcers. HAE also significantly ($p<0.001$) reduced the ulcer incidence (40 and 10%) and severity (54.35 and 85.37% protection) of duodenal ulcer, induced by cysteamine. HAE offered protection (49.57 and 58.97%) against ethanol-induced depletion of gastric wall mucus. And also, HAE reduced the ulcer index with significant decrease in plasma corticosterone (21.15 and 33.51% protection, $p<0.05$), lipid peroxidation (16.66 and 38.88% protection, $p<0.01$ and $p<0.001$), superoxide dismutase (17.64 and 47.25% protection, $p<0.05$ and $p<0.001$) and an increase in catalase (25.84 and 83.14% protection, $p<0.05$ and $p<0.001$) activity respectively.

Preliminary phytochemical screening of the HAE showed positive test for flavanoids, terpenoids, steroids, tannins and saponins. The results indicate that HAE possesses gastroprotective and antioxidant activity. *(International Journal of Pharmacology 4 (4): 252-257, 2008; **doi:** 10.3923/ijp.2008.252.257)*

Antioxidant Effect of ECG on Testosterone Propionate Induced Chromosome Damage

Tanveer Beg, Yasir Hasan Siddique, Gulshan Ara, Jyoti Gupta and Mohammad Afzal

The aim of this experiment was to find the appropriate dosage at which Testosterone Propionate (TP) is genotoxic enough to cause significant chromosome damage. TP was examined at 10, 20 and 40 μM, respectively and found to be significantly genotoxic at 20 and 40 μM, only in the presence of metabolic activation. Epicatechin Gallate (ECG) proved to be an effective antioxidant by reducing genotoxic damage. The results imply a strong genotoxic effect of TP *in vitro* on human lymphocytes and also a relevant antigenotoxic role of ECG in ameliorating steroid induced genotoxicity. *(International Journal of Pharmacology 4 (4): 258-263, 2008; **doi:** 10.3923/ijp.2008.258.263)*

Behavioural Effects of Hydroalcoholic Stem Bark Extract of *Randia nilotica* stapf. in Mice

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The behavioural effects of hydroalcoholic stem bark extract of *Randia nilotica* on the central nervous system were investigated. The tests employed were pentobarbitone sleeping time, amphetamine stereotyped behaviour, exploratory activity, performance on treadmills (rota-rod) and mouse beam walk assay. The results revealed that the hydroalcoholic stem bark extract of *Randia nilotica* has significantly ($p<0.001$) reduced the onset of pentobarbitone sleeping time in mice and significantly prolonged ($p<0.001$) the duration. The results were comparable to diazepam that was used as positive control. The extract has a biphasic effect on amphetamine stereotyped behaviour in mice. There was a significant ($p<0.001$) reduction in jumping/climbing, but reduction in sniffing was observed only at 5 mg kg^{-1}. Mean count in limb licking was attenuated only at 20 mg kg^{-1} body weight. A paradoxical increase in sniffing was observed with the extract at

20 mg kg^{-1} and in licking at 5 and 10 mg kg^{-1}. No observable effect on motor coordination (rota rod, beam walk assay) was observed with the extract at the doses tested. The extract also decreased exploratory activity in mice. The results have suggested that the crude hydroalcholic extract of *Randia nilotica* possesses some biologically active constituents with sedative activities. *(International Journal of Pharmacology 4 (4): 264-269, 2008;* ***doi:*** *10.3923/ijp.2008.264.269)*

Hepatoprotective and Antioxidant Action of *Moringa oleifera* Lam. Against Acetaminophen Induced Hepatotoxicity in Rats

S. Fakurazi, U. Nanthini and I. Hairuszah

This study is conducted to investigate the possible hepatoprotective action of *Moringa oleifera* Lam. (MO), a high value medicinal plant against a single high dose of APAP induced hepatotoxicity. Male Sprague Dawley rats were dosed with APAP (3000 mg kg^{-1} body weight; p.o.) to induce hepatocellular damage. In rats that were pretreated with MO (200 and 800 mg kg^{-1}; p.o.) for 14 days prior to APAP treatment, there was a reduction of liver enzymes (ALT, AST and ALP) and also the restoration of glutathione level. The biochemical results showed parallel finding with the histopathological analysis in which liver sections obtained from rats pretreated with MO, the damage was blocked. Intriguingly, MO alone has significantly elevated the level glutathione compared to the control group. The findings has suggested that *Moringa oleifera* Lam. is a promising product in protecting the liver against APAP induced liver injury via the restoration and elevation of glutathione level in the liver. *(International Journal of Pharmacology 4 (4): 270-275, 2008;* ***doi:*** *10.3923/ijp.2008.270.275)*

Effect of *Garcinia kola* Seed Extract on Female Reproductive Functions in Rats

B. Iranloye and B. Owokunle

The effects of *G. kola* seed extract on oestrous cycle, ovulation, implantation and pregnancy were studied in adult female rats with the aim of its possible use as female contraceptive. The three experimental groups were fed with *G. kola* seed extract (200 mg kg^{-1} body weight) (GKSE) and the control received distilled water once daily. Group 1 was fed with GKSE for three weeks and the estrous cycle monitored and number of ova released recorded. Group 2 consisted of

pregnant rats and received GKSE from day one of pregnancy. Equal numbers of the rats were sacrificed on days six, eight and 19th of pregnancy. The total number of implants, resorption and viable foetuses were weighed, examined and recorded. Group 3 animals received GKSE daily for three weeks; half of them were sacrificed after three weeks and the others were allowed three weeks to recover from the effect of the extract. Histology of the ovary, uterus and fallopian tubes were done. The results showed that the oestrous cycle was altered with a significant reduction in the occurrence of estrous and metestrous phase. Ovulation was partially blocked (70% blockage). No significant difference between the number and weight of the implantation sites in both pregnant control rats and the GKSE rats. No significant difference in both the foetal number and weight on day 19 of pregnancy. GKSE made the uterine endometrial gland inactive, stopped maturation of the follicles, caused acute inflammation of the tubes but all the organs showed full recovery after administration of GKSE was stopped. GKSE may be use as a contraceptive with a possible advantage of reversibility. *(International Journal of Pharmacology 4 (4): 276-281, 2008; **doi:** 10.3923/ijp.2008.276.281)*

Protective Effect of a Herbal Formula Against Carbontetrachloride Induced Hepatotoxicity

O. Prakash, G.N. Singh, R.M. Singh, S.C. Mathur, M. Bajpai and S. Yadav

This study investigated the protective effects of a polyherbal formula BCEZ, containing extracts of *Bacopa monneiri* Linn. Penn., *Curcuma longa* Linn., *Emblica officinalis* Gaertn. and *Zingiber officinale* Rosc., on the carbon tetrachloride (CCl_4) induced hepatotoxicity in rats. Hepatic injury was achieved by injecting 0.5 mL kg^{-1}, i.p. of CCl_4. The BCEZ at the doses 50, 100 and 250 mg kg^{-1}, p.o. offered significant hepatoprotective action by reducing the serum marker enzymes like Serum Glutamate Oxaloacetate Transaminase (SGOT) and Serum Glutamate Pyruvate Transaminase (SGPT). They also reduced the elevated levels of alkaline phosphatase (ALP). Histopathological studies further confirmed the hepatoprotective activity of BCEZ when compared with the CCl_4 treated control groups. The results obtained were compared with silymarin (100 mg kg^{-1}, p.o.), the standard drug. Thus it can be concluded, BCEZ might be a potential herbal agent for its hepatoprotective activity. *(International Journal of Pharmacology 4 (4): 282-286, 2008; **doi:** 10.3923/ijp.2008.282.286)*

Immunomodulatory and Antioxidant Activity of a Polyherbal Formulation

S. Meera, V.S.S.S. Gupta Atyam and N.S. Kumar

Immunomodulatory and antioxidant activity of Guard Sansar, a Polyherbal Formulation (PHF) was assessed by carbon clearance assay and adhesion of neutrophils to nylon fibers, in Swiss albino mice and by estimation of Lipid Peroxidation (LPO), Superoxide Dismutase (SOD), catalase (CAT) and reduced Glutathione (GSH) from blood of pyrogallol-treated Wistar rats, respectively, using Levamisole as reference standard. The PHF showed significant immunomodulatory activity by increasing the rate of carbon clearance and the percent neutrophil adhesion to nylon fibers. The oxidative stress, evidenced as elevation of LPO and reduction of SOD, CAT and GSH, was reversed by pre treatment with Polyherbal Formulation. Guard Sansar possesses immunostimulatory and antioxidant activity. *(International Journal of Pharmacology 4 (4): 287-291, 2008;* ***doi:*** *10.3923/ijp.2008.287.291)*

Effect of Hexane Extract of *Cassia fistula* Barks on Blood Glucose and Lipid Profile in Streptozotocin Diabetic Rats

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Medicinal plants play a major role in the management of Diabetes mellitusespecially in developing countries. The present study investigated the possible protective effects of hexane extract of *Cassia fistula* bark on certain biochemical parameters in Streptozotocin (STZ) induced diabetes in rats. *Cassia fistula* (Caesalpinaceae) has been used in traditional medicine. The barks of *C. fistula* have already been scientifically proved to possess anti-oxidant properties. The hypocholesterolemic and hypoglycemic effects of the hexane extract of stem bark of *C. fistula*, in normal and streptozotocin induced diabetic rats, were investigated in the present study. Hexane extract of *C. fistula* bark at doses 0.15, 0.30, 0.45 g kg^{-1} body weight for 30 days suppressed the elevated blood glucose levels in diabetic rats. The extract at 0.45 g kg^{-1} was found to be comparable with glibenclamide, the reference drug. The lipid profile (total cholesterol, triglyceride, HDL-cholesterol, LDL and VLDL-cholesterol) after the extract treatment at 0.45 g kg^{-1} body weight showed remarkable improvement compared to the diabetic control animals. Antioxidant and polyphenol content present in the extracts might contribute to the antihyperglycemic and antilipidemic properties. Thus the results suggest that *Cassia fistula* barks would be effective

in the treatment of diabetes and in prevention and management of coronary artery disease. *(International Journal of Pharmacology 4 (4): 292-296, 2008;* ***doi:*** *10.3923/ijp.2008.292.296)*

Cytotoxicity Assessment of the Aerial Parts of *Macrotyloma uniflorum* Linn.

S.M.A. Kawsar, E. Huq and N. Nahar

The fractionated crude extracts dichloromethane (CH_2Cl_2), ethyl acetate (EtOAc), 1-butanol (1-BuOH) and aqueous (H_2O) from aerial parts of *Macrotyloma uniflorum* were screened for cytotoxicity using the brine shrimp lethality bioassay technique. Most of the extracts were found to be non-toxic and this indicates that the ethnobotanical use (oral applications) of the experimental plant are justified. *(International Journal of Pharmacology 4 (4): 297-300, 2008;* ***doi:*** *10.3923/ijp.2008.297.300)*

Anticancer and Antimicrobial Activities of Zerumbone from the Rhizomes of *Zingiber zerumbut*

Ahmad B. Abdul, Siddig I. Abdelwahab, Adel S. Al-Zubairi, Manal M. Elhassan and Syam M. Murali

The aim of this study is to evaluate the anticancer and antimicrobial activities of zerumbone (ZER) from the rhizomes of *Zingiber zerumbut.* ZER is a crystalline sesquiterpene from the wild ginger, *Z. zerumbet*. This bioactive component has its unique structure, with a cross-conjugated ketone in an 11-membered ring, as well as remarkable biological activity. Thus, this compound has been isolated from the fresh rhizomes of *Z. zerumbet* using steam distillation and evaluated for its antimicrobial and anticancer activities. The antimicrobial effects were examined using disc diffusion method and group of microorganism, namely known as Methicilin resistant *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Salmonella choleraesuis*, *Bacillus subtilis*, *Candida albicans*, *Aspergillus ochraceaus* and *Sacchoromyces cerevisiae*. However, MTT assay was performed to determine the anti-cancer properties of zerumbone on human cervical cancer cells (HeLa) compared to cisplatin as positive control. Zerumbone has shown a dose dependent ($p<0.05$) anti-bacterial effect on *S. choleraesuis*, while no antifungal activity were observed. Zerumbone was also able to exert an antiproliferative effect towards cervical cancer cell line (HeLa) in time-dependent manner ($p<0.05$) (24, 48 and 72 h). It could be concluded that, zerumbone with

its unique chemical structure and versatile pharmacological activities might be a potential primer to develop new curative agents for possible various ailments. *(International Journal of Pharmacology 4 (4): 301-304, 2008; **doi:** 10.3923/ijp.2008.301.304)*

Redeeming Measure of Atorvastatin in the Risk Factors of Cardiovascular Disease

Vijaya Anand, Chenniappan, Kalavathy, Uma, Saravanan and Sampath Kumar

The present study was designed to determine the effect of atorvastain on C-reactive protein (CRP) in patients with Cardiovascular diseases (CVD). One hundred and fifteen patients with or without CVD were recruited for the study, of which 75 belongs to control (untreated) and 40 were test group (treated) and received daily with 10 mg day^{-1} of atorvastatin. The patients were followed for over a period of 3 months. For entire study population, CRP along with lipid profile, SGOT and SGPT were measured 1st day and at the end of 3rd month of the treatment. There was greater reduction in the levels of both atherogenic lipoproteins and CRP were found in test group when compare with control. These findings suggest that statin-mediated anti-inflammatory effects may contribute to the ability of atorvastatin to reduce risk for CVD. *(International Journal of Pharmacology 4 (4): 305-309, 2008; **doi:** 10.3923/ijp.2008.305.309)*

Anti Hyperlipidemic Activity of *Pedalium murex* (Linn.) Fruits on High Fat Diet Fed Rats

Mukundh N. Balasubramanian, P. Muralidharan and G. Balamurugan

The main objective of the study was to investigate about the anti hyperlipidemic potential of the ethanolic extract from the fruits of *Pedalium murex* at doses of 200 and 400 mg/kg/p.o. in high fat diet fed rats. Biochemical parameters like serum total cholesterol (TC), High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL), very low density lipoprotein (VLDL) and triglycerides (TG) levels were measured and compared with animals concurrently treated with reference standards Gemfibrozil and Atorvastatin. The ethanolic extract showed a significant decrease in triglycerides ($p<0.01$), LDL ($p<0.001$), VLDL ($p<0.01$), cholesterol ($p<0.001$) and a significant increase in HDL ($p<0.05$) levels at the tested doses. *(International Journal of Pharmacology 4 (4): 310-313, 2008; **doi:** 10.3923/ijp.2008.310.313)*

A Review on the Beneficial Effects of Tea Polyphenols on Human Health

J. Gupta, Y.H. Siddique, T. Beg, G. Ara and M. Afzal

The aim of this review is to focus some light on the beneficial effects of the tea polyphenols on human health, based on various laboratory, epidemiological and clinical studies carried out on tea and tea polyphenols in the last few years. Tea is second only to water as the most consumed beverage in the world. Tea has been consumed worldwide since ancient times to maintain and improve health. The health benefits associated with tea consumption have resulted in the wide inclusion of green tea extracts in botanical dietary supplements, which are widely consumed as adjuvants for complementary and alternative medicines. Depending upon the level of fermentation, tea can be categorized into three types: green (unfermented), oolong (partially fermented) and black (highly to fully fermented). Black tea represents approximately 78% of total consumed tea in the world, whereas green tea accounts for approximately 20% of tea consumed. Tea is particularly rich in polyphenols, including catechins, theaflavins and thearubigins, which are thought to contribute to the health benefits of tea. Tea polyphenols comprise about one-third of the weight of the dried leaf and they exhibit biochemical and pharmacological activities including antioxidant activities, inhibition of cell proliferation, induction of apoptosis, cell cycle arrest and modulation of carcinogen metabolism. Several studies demonstrate that most tea polyphenols exert their effects by scavenging Reactive Oxygen Species (ROS) since excessive production of ROS has been implicated in the development of a variety of ailments including cancer of the prostate gland (CaP). Tea catechins include (-)-epicatechin (EC), (-)-epigallocatechin (EGC), (-)-epicatechin gallate (ECG) and (-)-epigallocatechin gallate (EGCG). These catechins have been shown to be epimerized to (-)-catechin (C), (-)-gallocatechin (GC), (-)-catechin gallate (CG) and (-)-gallocatechin gallate (GCG), respectively, during heat treatment. Tea polyphenols act as antioxidants *in vitro* by scavenging reactive oxygen and nitrogen species and chelating redox-active transition metal ions. Among the health-promoting effects of tea and tea polyphenols, the cancer-chemopreventive effects in various animal model systems have been intensively investigated; meanwhile, the hypolipidemic and antiobesity effects in animals and humans have also become a hot issue for molecular nutrition and food research. *In vitro* and animal studies provide strong evidence that tea polyphenols may possess the bioactivity to affect the pathogenesis of several chronic diseases, especially cardiovascular disease and cancer. Research conducted in recent years reveals that both black and green tea

have very similar beneficial attributes in lowering the risk of many human diseases, including several types of cancer and heart diseases. *(International Journal of Pharmacology 4 (5): 314-338, 2008; **doi:** 10.3923/ijp.2008.314.338)*

Evaluation of the Chemoprotective Role of N-Acetylcysteine on Cisplatin-Induced Nephrotoxicity: New Aspect of an Old Drug

Amany A. Abdin, Eman I. Draz and Naglaa I. Sarhan

This study aimed to evaluate the chemoprotective role of N-acetylcysteine on experimental cisplatin-induced nephrotoxicity. Forty albino rats were divided into 4 groups (10 rats each); Group 1: normal control. Group 2: induced nephrotoxicity (cisplatin 1 mg/kg/day i.p, 7 days). Group 3: treated 1 h before cisplatin with N-acetylcystiene orally 400 mg/kg/day, 7 days. Group 4: treated 1 h after cisplatin with N-acetylcystiene in the same dose and duration. Cisplatin-induced nephrotoxicity (group 2) caused higher levels of serum creatinine and urea with marked DNA fragmentation, significant increase in caspase-3 reaction and significant increase in proximal convoluted tubules vacuolations when compared to the control group. N-acetylcysteine 1 h after cisplatin offered marked protection in comparison to its administration 1 h before cisplatin, manifested as significant amelioration of all studied parameters. In conclusion, N-acetylcysteine 1 h after cisplatin could be recommended as a well-tolerated effective chemoprotective therapy against the potential cisplatin nephrotoxicity. For the future, further researches are needed to judge the confliction about the effects of timing and different dosage regimen of N-acetylcysteine on the antitumor efficacy of cisplatin in various types of tumors. *(International Journal of Pharmacology 4 (5): 339-351, 2008; **doi:** 10.3923/ijp.2008.339.351)*

Acute Toxicity Study and Phytochemical Screening of Selected Herbal Aqueous Extract in Broiler Chickens

S.R. Hashemi, I. Zulkifli, M. Hair Bejo, A. Farida and M.N. Somchit

In order to collect ethnobotanical information about growth and health promoter plants as feed additive in broiler chickens, five medicinal plants *Euphorbia hirta*, *Solanum torvum*, *Zingiber officinale*, *Curcuma longa* and *Zingiber zerumbet* used by traditional medical practitioners for the treatment of several ailments of microbial and non-microbial origins were investigated for phytochemical screening and acute toxicity study. A total of 30 female broiler chicks were obtained. At

21 days of age, the chicks were allocated at random into six groups. Five chickens were assigned at random to each treatment in five replicates and kept in 30 cages (one chickens per cage) till five weeks of age. Five groups were administered a single oral dose of 2,000 mg kg^{-1} b.wt. while 5 mL distilled water was given to the control group of birds as placebo. Phytochemical screening study showed that plant contained volatile oils, tannins, alkaloids, saponins, flavonoids. Alkaloids and steroids were only found in the aqueous extract of *Euphorbia hirta*. Tissues were harvested and processed for photomicrographic examinations. Macro and microscopic observations indicated no alteration in liver and kidneys of the treated birds with 2000 mg kg^{-1} of selected herbal plants extract. In the hematological study, a highly significant decrease was observed in AST, ALT, ALP level of broiler group receiving the aqueous extract of *E. hirta* 14 after of administration. Acute toxicity study indicated that water suspensions of selected herbal aqueous extract are not toxic when administered by the oral route to experimental birds at 2000 mg kg^{-1} b.wt. In conclusion, the results obtained in the present study are in agreement to a certain degree with the traditional uses of the plants estimated as prophylaxis against various diseases and promote of health. *(International Journal of Pharmacology 4 (5): 352-360, 2008;* ***doi:*** *10.3923/ijp.2008.352.360)*

Local Delivery of Metronidazole and Chlorhexidine as Toothpaste in Treatment of Adult Periodontitis

N. Jenabian, M. Abedi, P. Tayebi and A.A. Moghadamnia

The present study was done to assess the effect of topically-applied toothpaste containing metronidazole (MTZ) and chlorhexidine (CHX) alone or in combination as an adjunctive non-surgical therapy in patients with Adult Periodontitis (AP). Eighty adult patients (50 females and 30 males, mean age of 35 years) with chronic moderate to advanced periodontitis participated in this trial. Following baseline clinical examination, including assessments of Plaque Index (PI), PPD, Clinical Attachment Level (CAL), Gingival Index (GI) and Bleeding on Probing (BOP), careful oral hygiene was instructed. The patients were randomly assigned to one of four treatment groups; placebo (toothpaste without antibacterial agents), MTZ 1%, CHX 0.2% and combined toothpaste of MTZ 1% and CHX 0.2%. Scaling and Root Planning (SRP) was done in two sessions one week before investigation. Clinical re-examination was performed at the end of week 2-4 after application of toothpaste. At the baseline the Mean±SD of PI for placebo (control treatment) and combined treatment group were 1.62 (0.83) and 1.62 (0.6) and

after 4 weeks of treatment were 1.42 (0.7) and 0.85 (0.52), respectively ($p<0.001$). The improvement in CAL of drug receiving subjects was greater than that of placebo ($p = 0.002$). Combined treatment group showed more improvement in PI, GI and BOP in compared with other groups. According to the results, for improving the parameters, combination of MTZ 1% and CHX 0.2% in toothpaste composition could be more effective than each of them alone. *(International Journal of Pharmacology 4 (5): 361-368, 2008;* ***doi:*** *10.3923/ijp.2008.361.368)*

Enzymatic and Non-Enzymatic Antioxidant Activities of *Enicostemma littorale* in *p*-DAB Induced Hepatocarcinoma in Rats

Ramamourthy Gopal and Rajangam Udayakumar

The aim of this study was to investigate the effect of *Enicostemma littorale* (Gentianaceae) aerial part on antioxidant defense systems of plasma and liver in *p*-Dimethylaminoazobenzene (*p*-DAB)-induced hepatocarcinoma in rats. The levels of vitamin-E and vitamin-C were estimated in plasma of control and experimental groups of rats. The levels of reduced glutathione, glutathione-S-transferase and activities of superoxide dismutase, catalase and lipid peroxides were assayed in liver tissue of control and experimental groups of rats. Administration of *p*-DAB exhibited a significant increase in the levels of liver lipid peroxides, liver weight and a concomitant decrease in the levels of vitamin-E, vitamin-C in hepatocarcinoma rats. Thus, there was an alteration in the antioxidant enzyme system of hepatocarcinoma rats. These alterations were reverted back to near normal level after the treatment with *Enicostemma littorale* extract and vitamin-E. Histopathological studies also revealed that the protective effect of *Enicostemma littorale* on liver cells. *(International Journal of Pharmacology 4 (5): 369-375, 2008;* ***doi:*** *10.3923/ijp.2008.369.375)*

Ficus hispida Linn. Leaf Extract Possesses Antioxidant Potential and Abrogates Azathioprine Induced Prooxidant and Antioxidant Imbalance in Rat Liver

T.S. Shanmugarajan and T. Devaki

The present study was set out to explore the antioxidant effect of methanolic leaf extract of *Ficus hispida* Linn. (FH) against azathioprine (AZA) induced liver

injury in male Wistar rats. *In vitro* antioxidant activity of FH was examined by 1,1-diphenyl-2-picrylhydrazyl (DPPH) and nitric oxide radical inhibition assays, the extract exhibited IC_{50} values of 29.33±1.14 and 21.51±0.96 μg mL^{-1}, respectively. The *in vivo* experiments revealed that AZA (50 mg kg^{-1} body weight; single intraperitoneal injection) caused a severe oxidative insult in the liver, which was depicted by a substantial drop in the enzymic [superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and glutathione-S-transferase (GST)] and non-enzymic antioxidants [glutathione (GSH), Vitamin C (Vit C), Vitamin E (Vit E)]. In contrary, pretreatment with FH (400 mg kg^{-1} body weight; pretreated orally for 21 days) maintained the antioxidant status at near normalcy. In addition, AZA induced lipid peroxidation (LPO) was also significantly alleviated by FH administration. These results underscore that *Ficus hispida* leaves possess remarkable antioxidant potential and hence it could be evaluated as an effective supplement to attenuate azathioprine induced oxidative stress. *(International Journal of Pharmacology 4 (5): 376-381, 2008;* ***doi:*** *10.3923/ijp.2008.376.381)*

A Critical Period for Deleterious Effect of Prenatal Alcohol Exposure on Working Memory

S. Nourizad, M. Anvari, H. Hasani and M. Salami

The present study aimed to locate a critical period for ethanol-induced spatial task impairments in the animals exposed to alcohol during the fetal life. Two month old rats born from mothers treated with alcohol (5.7 g kg^{-1}) during the 1st half (FH) and 2nd half (SH) and, the 1st (FQ), 2nd (SQ), 3d (TQ) and 4th quarter (FoQ) of gestational period were subjected to the working memory task. The experiments were carried out on an eight arm radial maze across 16 trials. The data presented here indicate that the animals in the FH group displayed a poor performance while those in the SH group had no problem in performing the maze task. Thus, it was concluded that the FH of pregnancy period is more sensitive to toxic effects of ethanol on the spatial task. Also, the FQ and SQ group's performance indicated that the latter was significantly weak in solving the maze task. The animals related to the TQ and FoQ groups displayed a similar behavior with the control rats. Findings of this study demonstrated that drinking alcohol during pregnancy underlies cognitive phenomena in offspring. Noticeably, the second 5 days of the fetal life in the rats is more susceptible to deleterious effects of alcohol on the spatial tasks. *(International Journal of Pharmacology 4 (5): 382-387, 2008;* ***doi:*** *10.3923/ijp.2008.382.387)*

Acute Oral Toxicity Evaluation of Some Polyherbal Formulations in Albino Wistar Rats

A.J. Joshua, K.S. Goudar, A. Damodaran, N. Sameera and A. Amit

The present study was conducted to evaluate the acute oral toxicity potentials of certain herbal veterinary preparations in albino Wistar rats. In the sighting study, the test substances were administered in sequential manner to one animal each at 2000 and 5000 mg kg^{-1} body weight followed by four animals at 5000 mg kg^{-1} body weight in the main study; whereas the test materials with well documented traditional use were evaluated at 5000 mg kg^{-1} body weight. The treated animals were observed for mortality, untoward clinical/toxic signs, alterations in body weight gain and necropsy findings during the study. The treated animals survived throughout the study period and did not reveal any treatment related major abnormal clinical signs at the tested dose levels for all the products. The overall percent body weight gain in rats treated with the herbal products was found to be normal during the 14 day observation period. On necropsy, no abnormalities were observed. In conclusion, acute oral toxicity testing of screened herbal veterinary products did not produce any treatment-related adverse effects upto the dose level of 5000 mg kg^{-1} body weight. *(International Journal of Pharmacology 4 (5): 388-392, 2008;* ***doi****: 10.3923/ijp.2008.388.392)*

Potentiating Effect of Piperine on Hepatoprotective Activity of *Boerhaavia diffusa* to Combat Oxidative Stress

S.K. Desai, V.S. Gawali, A.B. Naik and L.L. D'souza

The hydro alcoholic extract of roots of *Boerhaavia diffusa* (HEBD) was evaluated for its hepatoprotective activity against CCl_4 and Rifampicin-Isoniazid combination induced hepatotoxicity at two dose levels 150 and 300 mg kg^{-1}. HEBD exhibited a significant protective action on the liver evident by a reduction in the elevated levels of serum lysosomal enzymes namely Serum Glutamate Pyruvate Transaminase (SGPT), Serum Glutamate Oxaloacetate Transminase (SGOT), Alkaline Phosphatase (ALP) in both CCl_4 and Rifampicin-Isoniazid induced hepatotoxicity. Thus HEBD showed a dose dependent hepatoprotective activity. In addition, the hepatoprotective activity of *Boerhaavia diffusa* was evaluated for possible potentiation in the presence of piperine based on recent research which has reported the latter enhancing bioavailability of certain drugs and nutritional compounds. Piperine was checked for potentiation, if any, at two dose levels 10 and 20 mg, respectively. Piperine was found to produce a dose

dependent potentiation of the hepatoprotective activity of *Boerhaavia diffusa*. *(International Journal of Pharmacology 4 (5): 393-397, 2008; **doi:** 10.3923/ijp.2008.393.397)*

Screening of Anti-Arthritic, Anti-Inflammatory and Analgesic Activity of a Polyherbal Formulation

S. Meera, N.S. Kumar and V.S.S.S. Guptatyam

Anti-arthritic, anti-inflammatory and analgesic activity of Arthosansar (AS), a polyherbal formulation was evaluated and validated in various animal models. Arthritis was induced by Complete Freund's Adjuvant (CFA) injection in metatarsal footpad of Sprague-Dawley rats. Degree of inflammation was evaluated by hind paw swelling and body weight, estimation of AST, ALT and TP supported by histopathology of knee joint. AS reduced hind paw swelling, body weight, AST, ALT and TP Histopathology revealed significant reduction in mononuclear infiltration, pannus formation and bone erosion. AS decreased the paw volume in carageenan treated rats. As shows moderate central and peripheral analgesic activities in hot plate method and acetic acid induced writhing method in mice. *(International Journal of Pharmacology 4 (5): 398-402, 2008; **doi:** 10.3923/ijp.2008.398.402)*

Hemorheological Effects of Long-Term Administration of Combined Oral Contraceptive in Rats

R.E. Akhigbe, M.O. Azeez, S.F. Ige, I.P. Oyeyipo, F.O. Ajao and A.O. Soladoye

This study examined the effect of administration of combined Oral Contraceptive (OC) on blood viscosity and associated hemorheological parameters such as plasma viscosity, Pack Cell Volume (PCV), serum albumin, fibrinogen and total plasma proteins. Female wistar rats aged 7-10 weeks were selected and randomly distributed into two groups, the control group and the OC-treated group, with 20 rats in each group. The rats in both groups were fed with standard rat chow. After two weeks of acclimatization, rats in OC-treated group received OC therapy (containing 1.0 μg ethinyloestradiol and 10.0 μg of norgestrel), while rats in the control group remained on standard rat chow. After 7 weeks of treatment, hemorheological parameters were determined using standard hemorheological techniques described by Dacies and Lewis. Unpaired t-test was performed in all data with the significant level set at $p<0.05$. There was no significant change in

level of fibrinogen, while there was significant increase in blood viscosity, plasma viscosity, PCV, serum albumin concentration and total plasma proteins in OC-treated rats. This finding suggests that increase blood viscosity and plasma viscosity seen in OC therapy is associated with an increase in PCV and serum albumin level. *(International Journal of Pharmacology 4 (5): 403-406, 2008; **doi:** 10.3923/ijp.2008.403.406)*

Relationship Between Pharmacological Potency and Surface Activity of Cholic Acid Analogs

T.H. Zhang, J. Lin, C.G. Liu, R.G. Ding, J.X. Ruan, X.H. Sun, C.Q. Huang and X.C. Zhang

The aim of this study was to elucidate whether changes of surface activity of cholic acid analogs may lead to alteration of its pharmacological potency. The potencies of various cholic acid analogs were explored by two mice models, Perfluoroisobutylene induced pulmonary edema and Xylene induced ear edema. Determination of the Critical Micelle Concentration (CMC), an index for the comparison of the surface activity, of cholic acid analogs was also conducted. The results showed that administration of cholic acid analogs decreased the water content in the organ with a potency of chendehydroxycholic acid>dehydroxycholic acid>ursodehydroxycholic acid>hyodehydroxycholic acid>cholic acid. This is in accordance with the sequence of CMC. We suggest, that the effects of cholic acid analogs might be closely related with their surface activity. *(International Journal of Pharmacology 4 (5): 407-409, 2008; **doi:** 10.3923/ijp.2008.407.409)*

A Review on the Genotoxic Effects of Some Synthetic Progestins

Y.H. Siddique and M. Afzal

The present review gives the details of the genotoxic studies carried out till date for some selected synthetic progestins. Mutagenicity is defined as a permanent change in content or structure of the genetic material of an organism. A mutagenic hazard can be manifested as a heritable change resulting from germ-line mutations and/or somatic mutations leading to cancer or other chronic degenerative processes such as aging. Reactive Oxygen Species (ROS) generated through normal metabolic processes or from toxic products, can lead to a state of oxidative stress that contributes to the pathogenesis of a number of human disease by damaging lipids, protein and DNA. Oral contraceptives have been used since the early 1960s and

are now used by about 90 million women world wide. The pill is given as a combination of an estrogen and a progestogen. The estrogen component of combined oral contraceptives is either ethinylestradiol or mestranol and the progestogens used are cyproterone acetate, desogestrol, ethynodiol diacetate, levonorgestrel, lynestrenol, megestrol acetate, norethisterone, norethisterone acetate, norethynodrel, norgestimate and norgestrel. Little is known about the long term health risks and potential protective effects of these individual components. Synthetic progestins induced the genotoxic damage and also various types of cancers, both singly as well as in combination with estrogens. Various synthetic progestins have been tested for their genotoxic effects in different experimental models, using different genotoxic end points. Ethynodioldiacetate, norethynodrel, norgestrel, lynestrenol and medroxyprogesterone acetate were found to be genotoxic only in the presence of metabolic activation supplemented with NADP. Megestrol acetate, cyproterone acetate and chlormadinone acetate were found to be genotoxic in the absence of metabolic activation. On the basis of reports available it is suggested that the progestins in which double bond between carbon-6 and carbon-7 is present, they undergo nucleophilic reaction and generates free radical in the system to show the genotoxic effects and the progestins in which double bond between carbon-6 and carbon-7 is absent, they need metabolic activation like estrogens, such as estradiol-17β and ethinylestradiol to show the genotoxic effects. *(International Journal of Pharmacology 4 (6): 410-430, 2008; **doi:** 10.3923/ijp.2008.410.430)*

Low Molecular Weight Heparins Cross Rat Gastric Mucosa Mounted in an Ussing Chamber

B. Moazed and L.M. Hiebert

The aim of this study was to determine if the stomach is a site for low molecular heparin (LMWH) absorption. Gastric mucosa was mounted in a Vertical Diffusion Ussing Chamber and the LMWHs, tinzaparin or reviparin, were added to the mucosal buffer at pH 7.4 or 4.0. Potential difference (PD), resistance and short circuit current (Isc) were measured across the mucosa. Buffers and tissues were analyzed for chemical LMWH and anti-factor Xa activity. The PD became more negative on LMWH addition when the mucosal side was compared to the serosal side. The PD returned to baseline following a lag period, which was greater at pH 4.0 versus 7.4. Changes in resistance were similar to those for PD. Isc increased with time at pH 7.4 but not pH 4.0, which was most dramatic for reviparin. LMWHs were recovered from serosal buffer and tissue and had anti-factor Xa activity at both pH 7.4 and 4.0 although amounts found in serosal buffer and rate

of movement were greater at pH 7.4 versus 4.0. In conclusion, changes in PD, LMWH recovery and anti-factor Xa activity in serosal buffer indicate that LMWHs cross rat gastric mucosa. Changes in Isc suggest that active transport may depend on mucosal pH. Furthermore, LMWHs cross gastric mucosa under both neutral and acidic conditions, however transport is faster in a neutral environment suggesting that the stomach, with an acidic environment, may not be the main site for LMWH absorption *in vivo*. *(International Journal of Pharmacology 4 (6): 431-442, 2008; **doi:** 10.3923/ijp.2008.431.442)*

Preclinical Evaluation of PM 701 in Experimental Animals

F. Khorshid

In this study, we addressed the toxicological effect of PM 701 on various animal species. Results showed that there was no mortality recorded to doses up to 10 g kg^{-1} body weights during the 4 weeks of observation. Function tests for Liver (SGOT-SGPT-Alk.Phos) and kidney (urea and creatinine) revealed that PM 701 have no hepatotoxic or nephrotoxic effects. No hematological toxicity was detected. Histological studies, showed no effect on gastric mucosa, no alteration in liver or kidney parenchyamatous architecture. Hepatocytes showed preserved cellular outline with no signs of necrosis. Few renal tubules showed degenerative changes. Splenic tissue showed activation and enlargement of germinal centers of white pulp lymph nodules indicating activation of immune defense without any effect on vital body organs. Therefore, compared to toxicity induced by well known chemotherapeutic agent, PM 701 could be considered safe as potentially anticancer agent with minimal or even negligible effects on vital organs such as liver and kidney and recommended to be subjected to clinical trial in human volunteers. PM 701 was categorized as practically non toxic. *(International Journal of Pharmacology 4 (6): 443-451, 2008; **doi:** 10.3923/ijp.2008.443.451)*

Tramadol Effect on Morphine Dependency and Analgesia in Mice

Pouya Tayebi, Farzan Kheirkhah, Gouya Tayebi and Ali Akbar Moghadamnia

This study was performed to investigate the effect of tramadol on morphine dependency and analgesia. Mice were divided into 5 groups, (1) Morphine-dependent, (2) Tramadol-dependent, (3) Morphine-dependent accompanied by saline, (4) Morphine-dependent accompanied by tramadol (50 mg kg^{-1}) and (5)

Tramadol 30 min pretreatment of naloxone in the last day in morphine-dependent mice. Hot-plate, formalin and writhing tests were applied to investigate antinociceptive effect of tramadol in different doses (12.5, 25, 50 and 100 mg kg^{-1}). Latency time for jumping in group 4 (11.64±1.44 min) was less than group 1 (19.62±2.28 min) ($p<0.05$). The dose of 50 and 100 mg kg^{-1} of tramadol induced more tolerance in mice in hot-plate test. The most of this effect is for tramadol 100 mg kg^{-1} 30 min after beginning the test to be controlled ($p<0.05$). In formalin test tramadol 50 mg kg^{-1} in both acute (7.17±2.66 min) and chronic (19.5±9.22 min) phases showed the most effectiveness. In writhing test the most effective dose was 50 mg kg^{-1} of tramadol as well. It seems tramadol can increase the depth of morphine dependence in mice. Also, tramadol antinociceptive effect in high doses can appear the comparative effect with morphine in hot-plate, formalin and writhing analgesic models. *(International Journal of Pharmacology 4 (6): 452-459, 2008;* ***doi:*** *10.3923/ijp.2008.452.459)*

Alpha Mannosidase Inhibitory Effect of Some Iranian Plant Extracts

A. Gholamhoseinian, H. Fallah, F. Sharifi-Far and M. Mirtajaddini

Alpha 1,2-mannosidase is a key enzyme in N-glycan processing in the endoplasmic reticulum (ER) and Golgi apparatus, have been one of enzyme targets in the development of anti cancer therapies. One hundred species of plants with known and unknown medicinal properties were collected and botanically identified. Methanolic and aqueous extracts prepared by maceration method. Enzyme inhibitory effects against a-mannosidase was determined spectrophotometrically at pH 4.5 and 25°C using 0.5 mM *p*-nitrophenyl- α-D-mannopyranoside as the substrate and 1 units mL^{-1} Jack bean alpha mannosidase in 0.02 M citrate buffer. Among 200 extracts, ten extracts showed more than 20% inhibitory activity on alpha mannosidase; *Punica grantum*, *Damask rose* and *Quercus infectoria* among them showed more than 40%. The kinetic study of the enzyme showed that the inhibition mechanism of the three more active extracts were non competitive. Under the control condition K_m value for the enzyme was 1.59 mmol and V_{max} was 0.039 mmol min^{-1} V_{max} in presence of 4 μg mL^{-1} *Punica grantum*, *Damask rose* and *Quercus infectoria* extracts were 0.020, 0.022 and 0.025 mmol min^{-1}, respectively. The data indicated that these plants are good candidates for therapeutic use and deserve to purify the active agents effective against α- mannosidase. Further *in vitro* and *in vivo* studies are needed to reveal the actual effectiveness of each of them. *(International Journal of Pharmacology 4 (6): 460-465, 2008;* ***doi:*** *10.3923/ijp.2008.460.465)*

Ardioprotective Activity of Fruit of *Lagenaria siceraria* (Molina) Standley on Doxorubicin Induced Cardiotoxicity in Rats

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The aim of present study was to investigate the cardioprotective effect of *Lagenaria siceraria* (LS) fruit powder against the cardiotoxicity of doxorubicin (Dox) in rats. Male wistar rats (250-300 g) were randomly divided into three groups. Group 1-was control (gum acacia 2%), group 2-Dox (10 mg kg^{-1}), group 3-Dox+LS (200 mg kg^{-1} for 18 days). Dox (10 mg kg^{-1} i.v.) was administered in group 2 and 3 on day 16. After anesthetizing the animals on the 18th day, electrocardiogram (ECG) was recorded and blood was investigated for creatine kinase-MB isoenzyme (CK-MB), lactate dehydrogenase (LDH) and aspartate aminotransferase (AST) while determination of superoxide dismutase (SOD), reduced glutathione (GSH), lipid peroxidation (LPO) and histopathology was carried out for heart. Group 3 animals showed decreased QT and ST intervals ($p<0.01$ and $p<0.05$, respectively) and non significant increase in heart rate as compared to group 2. Significant decrease in serum CK-MB, AST ($p<0.001$) and LDH ($p<0.05$) of group 3 animals was observed as compared to group 2. There was significant increase in the level of GSH ($p<0.05$) and non significant increase in SOD, whereas lipid peroxidation ($p<0.01$) was inhibited in group 3 as compared to group 2. Histopathological study of LS treated group showed protection against myocardial toxicity induced by doxorubicin. Acute toxicity study showed that LS was safe at 5000 mg kg^{-1}. It is concluded that *Lagenaria siceraria* possessed cardioprotective effect against doxorubicin induced cardiotoxicity in rats. *(International Journal of Pharmacology 4 (6): 466-471, 2008;* ***doi:*** *10.3923/ijp.2008.46671)*

Hepatoprotective Activity of Livobond A Polyherbal Formulation Against CCl_4 Induced Hepatotoxicity in Rats

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In the present study, Livobond was evaluated for its hepatoprotective effects against carbon tetrachloride-induced hepatocellular injury in rats. Hepatotoxicity was induced in male Sprague-Dawley rats by intraperitoneal injection of CCl_4 (1.5 mL kg^{-1}) in olive oil (1:1). Livobond at a dose of 500 and 750 mg/kg/day and silymarin standard 50 mg/kg/day was administered orally for 7 days. The hepatoprotective effect of Livobond and standard was evaluated by the assay of

biochemical parameters viz., alanine aminotransaminase (ALT), aspartate aminotransaminase (AST), alkaline phosphatase (ALP), total and direct bilirubin, liver lipid peroxidation, total proteins, catalase and by histopathological studies of the liver. The toxic effects of CCl_4 in Livobond treated group was controlled significantly by restoration of the levels of serum bilirubin, proteins and enzymes as compared to the CCl_4 treated and silymarin treated groups. Histopathological studies further confirmed the hepatoprotective activity of Livobond. The results suggest that Livobond is able to significantly alleviate the hepatotoxicity induced by CCL_4 and may be attributed to the antioxidant property of the formulation. *(International Journal of Pharmacology 4 (6): 472-476, 2008;* ***doi:*** *10.3923/ijp.2008.47.476)*

Methanolic Extract of *Nigella sativa* Seeds is Potent Clonogenic Inhibitor of PC3 Cells

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We tried to find out the cytotoxic and anticancer property of methanolic extract of *N. sativa* seeds against prostate cancer cells (PC3). A concentration range of extract (100-0.01 μg mL^{-1}) in culture medium (DMEM) was tested. Inhibition of colony formation was studied and microscopic observations of stained colonies were performed. Colony inhibition at highest concentration (100 μg mL^{-1}) was 87.097% and at lowest concentration (0.01 μg mL^{-1}) it was 54.105. IC_{50} was <0.01 μg mL^{-1}. Microscopic observation confirmed karyolysis, karyorrhexin and picnosis in treated cells as well as presence of characteristic morphological changes associated with apoptotic cells like blebs, blisters and echinoid spikes etc. on cell membrane. These findings advocate that methanolic extract of *N. sativa* seeds is a potent clonoigenic inhibitor of PC3 cell and cell deaths might have taken place through apoptosis. However exact mechanism for apoptosis can not find out from this study but study may help in searching new effective medicine for prostate cancer therapy. *(International Journal of Pharmacology 4 (6): 477-481, 2008;* ***doi:*** *10.3923/ijp.2008.47781)*

Chloroquine Phosphate Potentiates Indomethacin and Hcl/Ethanol-Induced Gastric Mucosa Injury in Rats

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The aim of this study was to investigate the effect of Chloroquine phosphate (at therapeutic dose) on existing gastric ulceration in albino rats. Rats were treated

with Chloroquine phosphate (8.5 mg kg^{-1}) intramuscularly for 24 h after formation of ulcers induced by acidified ethanol and indomethacin. Following sacrifice, colorimetric assays were applied to determine the concentration of protein and mucus, activities of catalase and lipid peroxidation in homogenized gastric mucosal samples. Chloroquine phosphate worsens gastric lesions produced by both indomethacin and acidified ethanol. Also, it seemed to elaborate the indomethacin and acidified ethanol induced effects on gastric juice volume, pH and acid output. On the other hand, thiobarbituric acid reactants (TBAR) was further increased and protein, catalase and mucus were decreased in the gastric mucosal samples. The data indicates that the use of Chloroquine may be dangerous to the integrity of the stomach, especially in existing gastric ulcers. It increases oxidative stress in the gastric mucosa caused by indomethacin and acidified ethanol. *(International Journal of Pharmacology 4 (6): 482-486, 2008;* ***doi:*** *10.3923/ijp.2008.48.489)*

The Effect of Ethanol Extract of *Kucai* (*Allium schoenoprasum* L.) Bulbs on Serum Nitric Oxide Level in Male Wistar Ra1s

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The aim of this study was to determine the effect of ethanol extract of *kucai* bulbs on serum nitric oxide (NO) levels in rats, in an attempt to study the mechanism of antihypertensive action. The measurement of NO level was conducted by Griess colorimetric assay. The male Wistar rats were divided randomly into three groups; the first group was treated with *kucai* extract of 100 mg kg^{-1} body weight (*kucai*-treated group); the second group with isosorbide dinitrate (ISDN) of 0.18 mg kg^{-1} body weight (ISDN-treated group) and the third group with vehicle only (control group). The results showed that at 30 min (T_{30}) the mean NO level in *kucai*-treated group increased significantly (138.69±169.38%) compared to baseline (T_0); similarly, in ISDN-treated group, the mean NO level increased (212.08±140.01%) significantly. At T_{90}, average NO levels in *kucai*-treated group was significantly higher than those in control group ($p = 0.018$), while those in ISDN-treated group were not significantly higher than those in control group ($p = 0.436$). Compared to *kucai*-treated group, NO levels in ISDN-treated group at T_{90} was significantly different ($p = 0.028$). From this study it can be concluded that ethanol extract of *kucai* bulbs increased significantly serum NO level in experimental rats. Therefore, it is preassumed that antihypertensive effect shown by *kucai* is, one of which, due to mechanism of vasodilator action. The present results showed that *kucai* increased NO levels and this might be one mechanism of blood pressure lowering action of *kucai*. *(International Journal of Pharmacology 4 (6): 487-491, 2008;* ***doi:*** *10.3923/ijp.2008.48791)*

Inhibition of Human Cytochrome P450 Enzymes by Metallic Nanoparticles: A Preliminary to Nanogenomics

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The effect of nanoparticles on the biological functions or the relative toxicity is not well-understood and becomes the major public concerns. This study determined the *in vitro* effect of gold and silver nanoparticles as the two most frequently used metallic nanomaterials for therapeutics and diagnostic on the microsomes containing wild-type cDNA expressed human CYP450 enzymes CYP1A2, 2C9, 2C19 and 3A4. Results demonstrated that all of the CYP450s activities were down-regulated by metallic nanoparticles. These findings suggest the inhibition of oxidation based biological process by penetration of metallic nanosized particles across the microsomal membrane. *(International Journal of Pharmacology 4 (6): 492-495, 2008; **doi:** 10.3923/ijp.2008.49.495)*

Histomorphometric Study of Hepatocytes of Mice after Using Heroin

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This study was aimed to determine the histomorphometric properties of hepatocytes mice (Balb/c) after using heroin. The factors studied include the size of hepatocytes, nucleus diameter of hepatocytes, size of binuclear hepatocytes and nucleus diameter of binuclear hepatocytes of controls and treated experimental animals. A total of 30 male mice were divided into three control and two treatment groups. At first, different experimental groups were addicted to heroin with the dosage of 50 mg kg^{-1} IP for 3 days, twice daily and then were divided into two groups. One of them received heroin with a dose of 5 mg kg^{-1} IP and the other 5 mg mL^{-1} IP, twice daily for a period of 40 days. The results showed that the heroin could exert a significant effect on increasing the size of hepatocytes, size of binuclear hepatocytes, nucleus diameter of binuclear hepatocytes and nucleus diameter of hepatocytes in experimental groups. *(International Journal of Pharmacology 4 (6): 496-499, 2008 **doi:** 10.3923/ijp.2008.4949)*

Antibacterial Activity of *Phellinus gilvus* Aqueous Extract

C. Sittiwet and D. Puangpronpitag

Anti-bacterial activity of *P. gilvus* aqueous extract was screened using agar diffusion method. The aqueous extract of *P. gilvus* showed inhibition zone against

3 out of 8 tested bacteria (*L. plantarum* ATCC 14917, *E. coli* ATCC 25922 and *K. pneumoniae* ATCC 10031). The MICs against *L. plantarum* ACC 14917, *K. pneumonia* ATCC 10031 and *E. coli* ATCC 25922 were 45, 90 and 360 mg L^{-1} respectively while MBC were 90, 180 and 720 mg L^{-1}, respectively. The aqueous extract from *P. gilvus* showed good inhibitory effect against gram negative bacteria with low MIC and MBC. *(International Journal of Pharmacology 4 (6): 500-502, 2008;* ***doi:*** *10.3923/ijp.2008.500.502)*

Anti-*staphylococcus aureus* Activity of *Phellinus igniarius* Aqueous Extract

C. Sittiwet and D. Puangpronpitag

In this study, anti-bacterial activity of aqueous extract of *P. igniarius* against selected gram positive and gram negative bacteria using agar diffusion, broth macrodilution and agar dilution methods were investigated. The agar diffusion method revealed that *P. igniarius* aqueous extract showed inhibition zone against only *S. aureus* ATCC 24923. The susceptibility test against MSSA and MRSA revealed that *P. igniarius* aqueous extract showed inhibition zone against all of MSSA strains but cannot inhibit growth of MRSA. The broth macro dilution and agar dilution methods reveal MIC and MBC of *P. igniarius* against *S. aureus* ATCC 25923 was 1.25 and 2.5 g L^{-1}, respectively while MICs and MBCs against MSSA were 1.25-2.5 g L^{-1} and 0.25-0.5 g L^{-1}, respectively. The aqueous extract of *P. igniarius* showed inhibitory effect on growth of MSSA but not MRSA. *(International Journal of Pharmacology 4 (6): 503-505, 2008;* ***doi:*** *10.3923/ijp.2008.202.207)*