

Kurdistan 3rd Conference on Biological Sciences

I. ANIMAL SCIENCES

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Ectoparasites of the Asian Catfish *Silurus Triostegus* (Heckel, 1843) from Greater Zab River- Kurdistan Region- Iraq

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Abstract

A total of 226 Asian catfish *Silurus triostegus* were collected from Greater Zab river near Guwer district, southwest of Erbil city, Kurdistan of Iraq, during July 2007 to the end of June 2008. The fish were examined for ectoparasites. The study revealed the existence of ten species (with total prevalence 91%) included: seven species of protozoans (*Myxobolus poljanski*, *Chilodonella cyprini*, *Tetrahymena pyriformis*, *Ichthyophthirius multifiliis*, *Trichodina ranae*, *Scyphidia arctica* and *Apiosoma robusta*), one species of monogenetic trematode (*Ancylodiscoides vistulensis*) and two species of crustaceans (*Ergasilus mosulensis* and *E. sieboldi*). *T. ranae* and *A. robusta* represent first records in Iraq. Also, *S. triostegus* was regarded as a new host for four of these parasites which recorded in this study in Iraq.

Vasorelaxant Effect of Aqueous Extract of *Crataegus Azarolus Aronia* and Quercetin on Isolated Albino Rat's Thoracic Aorta

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Abstract

The aim of the present study was to investigate the vasoactive effects of aqueous extract (AE) of *Crataegus azarolus* (Var. aronia) and quercetin with a special emphases on their mechanisms of action on rat thoracic aorta. Muscle contraction and relaxation was recorder using PwerLab Data Acquisition System (ADI, Model ML 870) connected to a computer running chart software.

Quercetin (1×10^{-7} - 6×10^{-4} M) and AE (1×10^{-3} - 10 mg/ml) caused a concentration-dependent relaxation of endothelium-intact aortic rings precontracted with phenylephrine (10^{-6} M PE) or a high level of KCl (60 mM). AE and quercetin exhibited potent inhibitory effects on KCl- than PE- induced contractions. Quercetin shifted the PE concentration-response curve to the right hand side and downhill. L-NAME and indomethacin did attenuate the vascular effect of quercetin. From the data obtained during the present work, it can be concluded that quercetin induces concentration-dependent relaxation in rat's thoracic aorta. The mechanism of the relaxation may involves mainly the inhibition of NO and to a lesser extent of cyclooxygenase.

Effect of Different Glucocorticoids on Some Blood Parameters and Bone Marrow Cells in Albino Rats

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Abstract

In the present study we have investigated the effects of prolonged administration of different steroids, the differences between the effect of natural and synthetic steroids and the effect of short – acting agent hydrocortisone (hyd) (20mg/kg BW/day), intermediate–acting agent methylprednisolone (meth) (1mg/kg BW/day) and long–acting agent dexamethasone (dex) (1mg/kg BW/ day) on some blood parameters and bone marrow cells.. For this purpose, 70 young adult Wister Albino rats of both sexes were used as experimental bioassay animals. Rats were treated with twice daily doses of intraperitoneal injection of GCs. All designed blood parameters were assessed in normal animals in order to be used for comparison with effect of different experimental treatments. Normal saline was also injected to another group of normal rats in parallel with treated rats to examine the effect of stress of injections which had no appreciable changes in the measured parameters.

In the current study we found that both natural and synthetic GCs induced profound effects on blood and bone marrow cells. They had a common effect in increasing the numbers of RBC in the blood as well as Hb concentrations. Blood indices also showed great changes with more profound effects were seen by dex, which induced also a significant increase in the number of leukocytes in the blood. Lymphocytes were decreased in number by all treatments, while increased the number of neutrophils and suppressed the number of eosinophils in blood and bone marrow. Differentiations of bone marrow cells and blood cells were found to be altered more profoundly by dex as long acting agents than intermediate and short acting agents, making it an especial important drug for stimulating specific hemopoietic activity and produced profound action on leukopoiesis more than erythropoiesis. The intermediate acting agents (meth) showed more effects on erythropoiesis than leukopoiesis. The short acting agents (hyd) had mild effect on all stages of blood cells proliferation and differentiation.

Study of Some Biochemical Parameters in Follicle Fluid of Ovaries of Sheep, Cattle and Buffalo in Marshes of Iraq

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Abstract

The present study designed to determine the some biochemical parameters of follicle fluid of ovaries of sheep, cattle and buffalo in south of Iraq. The samples collected from Al-Nassiriya / Thi-Qar province / Iraq and then the ovarian follicles divided into two types included the large follicles and the small follicles. The results indicated a significant increase in glucose, cholesterol, total protein, AST and ALT in the large follicles compared with the small follicles in sheep, cattle and buffalo, while the total protein no different in sheep. On the other hand, significant differences were observed in LDH and ALP between large and small follicles in the three types of animals. There was non significant differences in albumin and urea in the large and small follicles , except the urea concentration was increased significantly in the large follicles compared with the small follicles in sheep.

Occurrence and Seasonal Abundance of Stink Bug *Apodiphus Amygdali* (Germar) (Hemiptera: Pentatomidae) On Some Fruit Trees in Certain Localities of Erbil Governorate

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Abstract

This study was carried out from May till October 2007, five species of Pentatomide stink bugs were recorded on many fruit and non-fruit trees in four stations (Shaqlawa, Kark village, Qusthapa and city center), these stink bugs are: *Apodiphus amygdali* (Germar), *Mustha spinulosa* (Lefebvre), *Mustha* sp., *Carcenoplistus acutus* (Signoret) and *Rhaphigaster nebulosa* (Poda), the last three species were recorded for the first time in Iraq.

It has been found that the hibernated stink bugs *A. amygdali* began their activity in the end of May in a year 2007, while the new emerged adults appeared in the beginning of July. The bug was presented in the field for about five months, during this period two population abundance were recognized, the first one was in fourth week of July and the second was in the second week of August. The high total mean number was recorded in Erbil city center while the lowest number was in Qushtapa.

The stink bug (nymphs and adults) was found feeding on the following trees: Plum, Apricot, Apple, Olive, Almond, Peach, Pear, Grape, Pomegranate, Eriobotrya, Citrus, Fig, Sumaq, Juglanus, Mulberry, Poplar, Planetree, Willow and Locust. The study showed that the *A. amygdali* prefer apricot, pear and apple upon others, also found this species did not attack wild plants.

Effect of Copper Exposure Time on Soluble Proteins and Enzymes in Freshwater Mussel *Dreissena Polymorpha*

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Abstract

The mussel *Dreissena polymorpha* used during the present study were collected from Al-Kadesia lake (Al-Anbar Governate-Iraq). The animals were exposed to 4 mg copper/l of water for 2,4,6 and 8 days. The soft tissue was analyzed for total soluble protein and activity of six enzymes using colorimetric and /or electrophoretic methods.

Copper was found to cause changes in the intensity of esterase bands and increases in the total protein content by increasing the exposure time to copper. Further more, exposure to copper increased the activities of the enzymes, glutamate oxaloacetate transaminase(GOT) and glutamate pyruvate transaminase (GPT), and decreased the activity of alkaline phosphatase (ALP) ,acid phosphatase (ACP) and Lactate dehydrogenase (LDH) with increasing of the exposure time. These changes may be useful as an earlier indicator for water pollution with copper .

Comparative Effects of Glucocorticoids on Some Aspects of Metabolism in Albino Rats

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Abstract

In this study we have investigated the general effects of prolonged administration of different GCs (natural and synthetic), and the effect of short-acting agent hydrocortisone (20mg/kg B.W/day), intermediate-acting agent methylprednisolone (1mg/kg B.W/day) and long-acting agent dexamethasone (1mg/kg B.W/ day) on metabolism. For this purpose, 70 young adult Wister Albino rats of both sexes were used as experimental bioassay animals. The rats were treated twice daily with intraperitoneal injections of GCs. Therefore, all designed parameters were assessed in normal control animals in order to be used for comparison with effect of different experimental treatments. Normal saline was also injected to another group in parallel with the treated rats to examine the effect of stress of injections which had no appreciable changes in the measured parameters.

Our results indicate that natural and synthetic GCs seem to have variable effects on metabolism; we recognized that natural GCs had more profound effects on carbohydrate metabolism than synthetic GCs. GCs caused an imbalance in lipid metabolism leading to hyperlipidemia. Synthetic GCs had more effect on causing hypertriglyceridemia than natural GCs. According to our experimental circumstances, no significant effects were found on protein metabolism. GCs induced variable effects on altering the liver enzymes including GGT, GPT and GOT. Synthetic GCs also seem to produce more obvious elevations in these enzymes than naturally secreted hormones. Body weight was markedly increased by normal saline, hydrocortisone and methylprednisolone; while dexamethasone did not cause detectable increase in body weight which might be due to its catabolic effect. Ultimately this study has found that synthetic GCs have more profound effects on lipid, protein and liver enzymes metabolism suggesting that extreme caution should be taken using synthetic GCs.

Effect of Vitamins C, E and Their Interaction(C and E) On Some Physiological Aspects of Cupper Treated Laboratory Mice

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Abstract

The current study was design to determine the effect of vitamins C, E and their interaction on cupper-poisoned mice .The study divided into two parts. The first one was dealing with the role of vitamins on hematological and biochemical measurements .The second part was dealing with male and female reproductive parameters.

The results showed the toxic effect of cupper injection at a conc. of 6 mg/kg body weight, caused a sever decrease in the RBC; Hb and PCV, where as the total number of WBC were elevated companied with increased percentage of the lymphocytes and acidophil. High levels of AST , ALT and cholesterol were observed. The fertility and reproductive values were deteriorated .When vitamin C (10 mg / kg), E (8 IU / kg) and their interaction(C and E) offered to the cupper treated mice, a significant increase in the blood picture with an improvement in their percentages. The cholesterol, AST and ALT all were decreased in their values. The reproductive efficacy of both males and females showed an improvement in their parameters.

Antimutagenic Effects of Propolis

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Abstract

The cytogenetic effects of (3-Methylcholanthrene, propolis, propolis+3-Methylcholanthrene and 3-Methylcholanthrene+propolis) on male of albino mice were studied.

The following results were obtained (1) 3-Methylcholanthrene alone has created chromatid and chromosome aberrations in male mice in both bone marrow and spermatogonial cells as (centromeric gap, centromeric break, ring chromosome, dicentric chromosome, polyploidy and tetrad), also reduced the mitotic index in both cell types of treated male mice, also created sperm abnormalities as (sperm without head, sperm without tail, sperm without hook, defective head sperm, swollen head sperm and blunt hook sperm), (2) Ethanolic extraction of propolis had ability to inhibit the effect of 3-Methylcholanthrene on chromatid and chromosome aberrations, sperm abnormalities and mutagenic effect.

The Ecology of *Mastacembelocleidus heteranchorus* (Monogenetic Trematode) Parasitizing Gills of *Mastacembelus mastacembelus* from Greater Zab Rivers, Kurdistan Region- Iraq

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Abstract

A total of 128 fish belonging to *Mastacembelus mastacembelus* were collected from Greater Zab river in Kurdistan region- Iraq, during the period from July 2007 until the end of June 2008. The examination of gills revealed the presence of monogenetic trematode *Mastacembelocleidus heteranchorus*. The overall prevalence was 85.15% with mean intensity of 24.23. No significant differences were noticed in the infection of male and female fish with the parasite. A sharp decrease in the intensity of infection was noticed with increasing fish length since the prevalence was 94.44% in the smaller fishes (20-29 cm) as compared with 41.66% in larger fish (60-69 cm). Infection with this worm in general showed monthly fluctuations, as it was high during April and May and low during January and February.

Endoparasites of the Asian Catfish *Silurus triostegus* (Heckel, 1843) From Greater Zab River- Kurdistan Region- Iraq

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Abstract

A total of 226 Asian catfish *Silurus triostegus* were collected from Greater Zab river near Guwer district, southwest of Erbil city, Kurdistan region, Iraq, from July 2007 to the end of June 2008. The fish were examined for endoparasites. The study revealed the existence of ten species of parasites (with total prevalence 78%) included: five species of digenetic trematodes (*Azygia robusta*, *Orientocreadium siluri*, *Megamonostomella rashediansis*, *Diplostomum flexicaudum* and *D. spathaceum*), three species of cestodes (*Proteocephalus osculatus*, *Neogryporhynchus cheilancristrotus* and *Polyoncobothrium clarias*) and two species of nematodes (*Procamallanus viviparus* and *Contraecaecum* sp.). *Azygia robusta* represent first records in Iraq. Also, *S. triostegus* was regarded as a new host for five of these parasites which recorded in this study in Iraq.

Host-Parasite Relationship: Biometrical Study on the Developmental Stages of *Sarcocystis cruzi* Parasite

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Abstract

The Biometry of *Sarcocystis cruzi* developmental stages in the intermediate (cattle) and final (dog) hosts showed that microcytic cysts either of esophagus or heart of intermediate host are varies in their measures as those for the esophagus reach 688-899 μm X 61-81 μm (average of 573 microscopic cysts) while those for heart type which reach 208-326 μm X 60-79 μm (average of 525 microscopic cysts). These differences were significant ($P < 0.01$) statistically. Also, the compartment septa were very clear in heart type rather than esophagus type which refers to the relation between parasite and colonized organs.

Other developmental stage, the cystozoites (intra cystic stage) occur in two measures as long type (15.6 X 5.2 μm) and short type (13 X 5.2 μm) and the difference between these two forms was significant ($P < 0.05$) for 200 cysts of each. The developmental stages in final host lamina propria of small intestine showed the same difference for microgamete (13.5 X 9.27 μm) and for macrogamete (13 X 5.2 μm) for 50 cysts of each were measured and showed (significant, $P < 0.05$) in addition to difference in morphological features. The oocysts (contain two sporocysts) measures were 15.9 X 10.6 μm while the measurements of the free sporocysts in feces were 16 X 10 μm (these measurements are the mean of 30 of each and showed significant differences ($P < 0.01$)).

Protective Effects of Fasting And Selenium in Diethylnitrosamine-Induced Liver Carcinogenesis in Male Albino Rats

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Abstract

Background: Human liver cancer, primarily hepatocellular carcinoma (HCC), is both common and lethal. Nitrosamine compounds are known hepatic carcinogens. This study was designed to investigate the efficacy of fasting and selenium on diethylnitrosamine (DEN)-induced hepatocarcinogenesis in male albino rats. **Methods:** Tumor initiation was achieved by a single intraperitoneal (i.p.) injection (200mg/kg body weight) of diethylnitrosamine (DEN) in male albino rats. Rats were divided into four groups. The first group were given the standard rat diet and tap water ad libitum. The second group received a single i.p. injection of DEN for 12 weeks. The third group received DEN as mentioned in second group along with fasting twice a week for 12 weeks. The rats of the fourth group treated with DEN and received selenium in drinking water at a dose of 5 ppm for 12 weeks. At the end of the experiment, the sera were collected for evaluation of reduced glutathione (GSH), nitrite (NO_2) and nitrate (NO_3), malondialdehyde (MDA), superoxide dismutase (SOD), alkaline phosphatase (ALP), acid phosphatase (ACP) and adenosine deaminase (ADA). **Results:** The results showed that in DEN-treated rats, GSH, SOD significantly decreased ($P < 0.05$) as compared to control group, while NO_2 , NO_3 , ALP, MDA and adenosine deaminase significantly ($P < 0.05$) increased. Fasting rats showed significantly decrease of ALP, NO_2 , NO_3 , MDA and ADA, while GSH significantly increased comparing to DEN group. Significant ($P < 0.05$) decrease of ALP, NO_2 , NO_3 and MDA were recorded in selenium group. **Conclusion:** These observations indicate that fasting and selenium administration can counteract oxidative action of DEN.

A Survey of Zooplankton Invertebrates in Greater Zab River, Kurdistan Region-Iraq

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Abstract

A survey of zooplankton invertebrates has been carried out at three selected sites on Greater Zab River. Monthly samples were collected during the period from March 2005 to March 2006. Some physical and chemical properties of water were studied including water temperature (from 4 to 30°C), hydrogen ion concentrations (from 6.32 to 8.07), dissolved oxygen (from 4.2 to 13.2mg/l), and current velocity (from 0.661 to 1.737 m/s). The results showed that the seven species from the recorded zooplankton were belonged to Cladocera with dominance of *Scapholeberis aurita* and *Simocephalus vetulus*, and six species of Copepoda with the dominance of *Eucyclops elegans* and *E. agilis*. On the other hand, Sorensen similarity index was used to compare between the studied sites, and the results showed that the highest similarity was recorded between Efrac and Khabat sites with 57.14%.

***Balantidium Polyvacuolum* Li, 1963 (Ciliophora: Spirotricha):
First Occurrence In The Intestine Of *Cyprinus Carpio* From
Three Fish Farms In Erbil City, Kurdistan Region, Iraq**

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Abstract

The ciliated protozoan *Balantidium polyvacuolum* Li, 1963 was recorded in the present study for the first time in Iraq from intestine of the common carp *Cyprinus carpio* (Family Cyprinidae) which collected from three fish farms located southern of Erbil provenance, Kurdistan region, Iraq during the period between June 2009 until the end of August 2009. The prevalence of infection was 15%. The description and measurements of this parasite were given in this study.

Effects of Fenugreek Seeds on Reproductive Efficiency in Normal and Alloxan Induced Diabetic Male Rats

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Abstract

The present study aimed to investigate the effects of feeding 5% fenugreek seed powder and its aqueous extract for a period of 4 weeks on the reproductive efficiency, and some organ tissue structure in normal and alloxan diabetic male rats. The design of research based on 2 experiments: In experiment 1 (effects of fenugreek seed powder and its aqueous extract on normal male rats) the treatment with aqueous extract significantly increased the litter size ($P < 0.05$) and male sex ratio ($P < 0.05$) when compared to control group, whereas the difference between male sex ratio and female sex ratio in both experimental groups are non significant when in control group female sex ratio is significantly more than male sex ratio ($P < 0.01$). Also the histological examinations of testes in treatment of aqueous extract revealed more activity in spermatogenesis. In experiment 2 (effects of fenugreek seed powder and its aqueous extract on diabetic male rats) although both treatments, particularly aqueous extract positively acted on tissue structure of testes and pancreas, none of the females were fertilized by diabetic males of both experimental groups.

It is concluded that the seed powder and the aqueous extract increase the male sex ratio while the litter size is increased only in treatment with aqueous extract. This increase in fertility mainly may be attributed to increase in testosterone release and / or to direct action of bioactive substance(s) in fenugreek seeds. The infertility in diabetic males of both experimental groups with regained activity in spermatogenesis may be return to erectile dysfunction which is not improved in both experimental groups.

Effects of Ginkgo Biloba and A-Tocopherol on CCl₄- Induced Liver Fibrosis and Thrombosis in Male Albino Rats

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Abstract

The effect of *Ginkgo biloba* and α -tocopherol was investigated on white blood cells (WBCs) count, platelet count, mean platelet volume (MPV), platelet distribution width (PDW) and platelet large cell ratio (P-LCR), in the diagnosis of liver fibrosis and thrombosis in carbon tetrachloride treated male albino rats.

Rats were divided into four groups, rats maintained on a normal diet for 5 weeks, rats maintained on a high carbon tetrachloride injection, and other two groups received *Ginkgo biloba* in the diet alone and *Ginkgo biloba* with α -tocopherol.

Rats injected with carbon tetrachloride showed significant increased platelet count and PDW. *Ginkgo biloba* decreased WBCs count, platelet count, PDW, MPV and P-LCR significantly. On the other hand, combination of *Ginkgo biloba* with α -tocopherol decreased WBCs count, PDW, MPV and P-LCR significantly.

It is concluded that carbon tetrachloride injection in male albino rats is associated with liver fibrosis and thrombosis, throughout increasing WBCs count and platelet indices. While, *Ginkgo biloba* is very powerful in removing thrombosis and decreasing thrombotic indices.

Protective Roles of Omega-3 in Dexamethasone Treated Female Rats

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Abstract

The present study was conducted to investigate the effect of omega-3 on systolic blood pressure (SBP), some serum lipid profiles, calcium and potassium in dexamethasone-induced hypertensive rats. **Materials and Methods:** To assess the antihypertensive effect of omega-3 on dexamethasone-induced hypertension, the experiment was designed as the following: Group1: Control. Rats of this group received standard rat diet and tap water ad libitum. Group2: Dexamethasone. Rats of this group received 1mg /L of dexamethasone via the drinking water. Group3: Dexamethasone + omega-3. Rats of this group received 1mg /L of dexamethasone via the drinking water and omega-3 (40mg /kg diet) for 30 days. **Results:** Statistical analysis revealed that systolic blood pressure was significantly increased in dexamethasone treated rats compared to the control group. Omega-3 administration caused a marked decrease but not significantly in the elevated SBP rats. Heart rate (HR) non significantly increased in group II and slightly decreased in group III. Hypercholesterolemia and hypertriglyceridemia that were detected in dexamethasone treated rats were statistically improved and returned to the control group by omega-3 administration. There was no statistical difference in serum potassium among the studied groups, while serum calcium tended to decrease after dexamethasone administration. After 30 days of dexamethasone administration, body weight tended to reduce statistically. However, omega-3 supplementation did not return body weight to control value, a slight improve of body weight was detected by omega-3. **Conclusions:** The results concluded that hypercholesterolemia and hypertriglyceridemia that were detected in dexamethasone treated rats were improved by omega-3, it also markedly decreased SBP and slightly increased body weight in dexamethasone treated rats. However, the mechanisms by which how dexamethasone elevates SBP is not fully understood, but the present results suggest that calcium ions may not be involve in this elevation.

Effect of Antidiabetic Drugs Metformin and Glibenclamide on Rabbit Ileal Smooth Muscles Contractions

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Abstract

Isolated ileal strips of rabbits were used in the present study to investigate the effect of antidiabetic drugs (metformin, glibenclamide) on their smooth muscles contractions. Student's kymograph and glass jacket organ were used for recording. The results showed that smooth muscles of rabbit ileum exhibit auto rhythmic contraction and this contraction was enhanced by both ACh and KCl.

Metformin exerted different effects on ileal smooth muscle contractions depending upon the concentration used. Both low (30-60 mg/ml) and high (400-1750 mg/ml) concentrations exerted inhibitory effects while moderate concentrations (80-350 mg/ml) exerted excitatory effects on ileal smooth muscles. Metformin drug led to the development of biphasic contraction of ACh induced contracture, and Ca^{+2} -free saline abolished the contraction in these muscles in response to metformin.

Glibenclamide exhibited relaxant effect in a concentration dependent manner except that of moderate concentrations (60,80 mg/ml), which enhanced tonic contraction in these muscles and high concentration (250 mg/ml) rapidly caused relaxation and fall in resting tension. Glibenclamide reduced the tonic phase of ACh induced contracture, Ca^{+2} -free saline reduced muscle response to (250 mg/ml) of glibenclamide.

The Addition of Acetic Acid or Ethanol to Orally Taken Aluminum Salt Solution Enhanced Its Availability and Then Induced Toxic Effects

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Abstract

Aluminum (Al) intoxication was initially reported in patients undergoing hemodialysis and then linked to Alzheimer's disease. Man usually exposed to Al containing antacids, vaccines of food cooked in Al utensils. The assumption of ingesting sour juices as acetic acid or ethanol may affect favourably the degree of Al absorption is justified.

Four groups of 10 mature male rats were used. The drinking water (DW) containing 5 mM of $Al_2(SO_4)_3$ with 1 % glacial acetic acid and or / ethanol made available *ad-ibidum*. Brain and plasma Al and Ca were determined, in addition to automated complete blood count (CBC) after 10 weeks of treatment.

The results of plasma Al level indicated that, the addition of acetic acid or ethanol o Al containing drinking water enhanced significantly its absorption and even more combined relative to control. This enhancement was evident as well as well in Al and Ca deposited in the brain while no change in the plasma Ca was observed. The CBC results showed the presence of highly significant thrombocytopenia for the first time, in addition to microcytosis and hypochromia. In conclusion, the addition of acetic acid and/or 10% ethanol to Al containing drinking water enhanced Al absorption when acid is used and an additive effect when both are used. The toxic plasma level caused Microcytosis and severe thrombocytopenia in addition to brain atrophy.

Role of K⁺ Channels in Vasodilation Induced by Nitric Oxide in Rat Aorta

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Abstract

The present study is concerned with the role of ATP-sensitive potassium (K_{ATP}), Ca^{+2} -dependent potassium (K_{Ca+2}), and inward rectified potassium (K_{IR}) channels in mediating relaxation in response to nitric oxide (NO) donor, and sodium nitroprusside (SNP) in rat thoracic aorta. SNP (3×10^{-9} - 3×10^{-5} M) caused a concentration - dependent relaxation in phenylephrine (1×10^{-6} M) and KCl (60 mM) precontracted thoracic aortic rings with an IC_{50} of 4.195×10^{-6} and 1.991×10^{-5} M, respectively. Prior to study the effect of selected K channel blockers, aortic rings were incubated with 1mM tetraethylammonium (TEA), 1mM barium chloride ($BaCl_2$) and 1 μ M glibenclamide (GLIB) individually and in combination. This was followed by precontraction of the tissue with PE and after the formation of smooth muscle plateau, the muscle was relaxed using SNP. Both TEA and GLIB caused a rightward shift in the concentration–response curve of SNP with IC_{50s} of 5.709×10^{-7} and 1.021×10^{-6} , respectively. On the other hand, $BaCl_2$ caused a leftward shift in the concentration–response curve of SNP with an IC_{50} of 4.501×10^{-6} . After incubating the aortic rings with TEA, GLIB, $BaCl_2$ and their combinations, elevation of extracellular K⁺ concentration to 60mM and reaching a contraction plateau, SNP produced significant relaxant effect with IC_{50} of 2.432×10^{-9} ; 8.982×10^{-10} ; 2.991×10^{-6} , and 4.369×10^{-6} , respectively. These results suggest that K_{Ca+2} , K_{IR} and partially K_{ATP} channels are involved in the SNP- induced dilation of rat's thoracic aorta.

The Effect of Phosphodiesterase-5 Inhibitors on Isolated Rat Vas Deferens and Aortic Smooth Muscle

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Abstract

Phosphodiesterase-5 (PDE5) inhibitors showed a vasodilator effect on precontracted isolated rat smooth muscles through increasing the half life of cyclic nucleotide, cyclic guanosine monophosphate (cGMP). The level of cGMP can be modulated by Phosphodiesterase isoenzymes, mainly by PDE5. Sildenafil reduced the contractile tone of vas deferens by 35.07%. Tadalafil showed a potency higher than that of sildenafil and vardenafil since it reduced the contractile force in the isolated rat vas deferens by 47.23%. On the other hand, vardenafil showed a relaxant effect lower than that of sildenafil in isolated rat vas deferens, and reduced the contractile tone by only 31.02%. PDE5 inhibitor also showed a vasodilator effect on precontracted rat aorta. The maximum relaxant effect (E_{MAX}) of sildenafil was 28.39%; however it was lower than its effect on vas deferens. Tadalafil also showed a vasodilator effect and caused a concentration dependent relaxation in precontracted aortic smooth muscle. However tadalafil's maximum relaxant effect (24.89%) which was lower as compared to sildenafil. The relaxant effect of vardenafil was more or less similar to that of sildenafil with E_{MAX} value of 28.1%. It can be concluded from these results that both sildenafil and vardenafil produced more or less the same relaxant effect which was higher than that produced by tadalafil.

Neural cell differentiation of mesenchymal stem cells isolated from human umbilical cord blood in vitro in Dohuk province, Kurdistan region of Iraq

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Abstract

Human umbilical cord blood (UCB) contains Hematopoietic stem cells (HSCs) and Mesenchymal stem cells (MSCs), both of which are regarded as valuable sources for cell transplantation and cell therapy. Little success has been reported about the isolation of such cells from cord blood, so here we reported a novel method to obtain expanded culture of MSCs from a mononuclear cell (MNC) fraction of human UCB. These cells in their undifferentiated state are spindle shaped and with fibroblast – like in morphology , self – renewal , and have the ability to *in vitro* differentiation potential to the neuroglial like cells under appropriate induction conditions. These cells when treated with Retinoic acid (RA), or Epidermal growth factor (EGF) , rapidly assumed the morphology of multipolar neurons. The resulting differentiated cells express nestin, a neurofilament protein that is one of the most specific markers of multipotent neural stem cells. The neurogenic potential of UCB- derived may facilitate stem cell therapeutic approaches to neurodegenerative diseases. In conclusion, UCB dose contains MSCs and it can serve as an alternative source of MSCs to Bone marrow.

Check-List Of Nematode Parasite Of Freshwater Fish In Iraq And Their Histopathological Effect

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Abstract

A total of 18 species of nematode parasitic worms were reported from different freshwater fishes in Iraq. These worms belong to (7) family and (11) genera and 16 species. The nematodes are: *Agamospirura* sp., *Anisakis* sp larva, *Camallanus lacustris*, *Contracaecum* larve, *Cucullanus cyprini*, *Cucullanus* sp., *Dujardinascaris* sp., *Echinocephalus uncinatus*, *Goezia* sp, larvae *philometra intestinalis*, *philometra* sp., *Procamallanus viviparous*, *Rhabdochona helichii*, *Rahbdochona similes* *Rhabdochona grandipapillata*, *Spiroxys* sp. Larva. It can be concluded that *Contracaecum* sp larva is the abundant nematode parasite among Iraqi fishes. The *histopathological* studies were carried out for some of these nematode such as *Contracaecum* sp larvae, and *Spiroxys* larvae in different organs and on different hosts. The main histopathological changes recorded are necrosis, fibrosis, destruction of epithelial tissues, hypertrophy of hepatocytes, congestion, proliferation of lining cells.

KARYOLOGY OF *Nannospalax ehrenbergi* (Nehring 1898)

(RODENTIA: MAMMALIA) IN TURKEY

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Abstract

Spalacidae are East-Mediterranean blind subterranean rodents highly adapted for life underground. Morphologically, they are cylindrical, powerful, heavy-bodied animals with short limbs and claws, and projecting incisors. The phylogeny and systematic of the family has been

largely intractable since the establishment of the family and down to the lower taxa. Karyotypic studies of Spalacidae reveal that diploid chromosome numbers ($2n$) varies between 38 and 62 and the chromosomal arm number (NF) between 66 and 124.

The species, *Nannospalax ehrenbergi* originally described by Nehring (1898), on specimens collected from Yafa-Israel also occurs in Libya, Syria, Jordan, Lebanon, Israel, Egypt, Iraq, and Southeast Anatolia of Turkey.

In this study, distribution of chromosomal forms of *Nannospalax ehrenbergi* in South and Southeast Anatolia was investigated. The material of more than 200 specimens of *Nannospalax ehrenbergi* was collected at 75 different localities in the region, South and Southeast Anatolia. Preparations of mitotic chromosomes were obtained from bone marrows by means of the general air-drying technique. Skins and skulls of specimens have been deposited at the Dicle University, Science Faculty Biology Department.

We have identified five different chromosomal forms of *Nannospalax ehrenbergi* in Turkey of which have diploid chromosome numbers ($2n$) are $2n = 48$ (Hatay-Yayladağı); $2n=52a$ (Hatay-Arsuz); $2n=52b$ (Diyarbakır); $2n=56a$ (Tarsus); and $2n=56b$ (Siirt-Kurtalan).