

مجلة التربوي

مجلة علمية محكمة تصدر عن كلية التربية

جامعة المرقب

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يناير 2018م

هيئة التحرير

- | | |
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المجلة ترحب بما يرد عليها من أبحاث وعلى استعداد لنشرها بعد التحكيم .
المجلة تحترم كل الاحترام آراء المحكمين وتعمل بمقتضاها .
كافة الآراء والأفكار المنشورة تعبر عن آراء أصحابها ولا تتحمل المجلة تبعاتها .
يتحمل الباحث مسؤولية الأمانة العلمية وهو المسؤول عما ينشر له .
البحوث المقدمة للنشر لا ترد لأصحابها نشرت أو لم تنشر .
حقوق الطبع محفوظة للكلية .

بحوث العدد

- "تحفة الأنام بتوريت ذوي الأرحام" دراسة وتحقيقاً
- الاستفهام ودلالاته في شعر خليفة التليسي
- قراءة في التراث النقدي عند العرب حتى أواخر القرن الرابع الهجري
- الكناية في النظم القرآني (نماذج مختارة)
- حذف حرف النداء "يا" من اسم الإشارة واسم الجنس واختلاف النحاة في ذلك
- (أي) الموصولة بين البناء والإعراب
- موج النحاة في الوصف بـ(إلا)
- تقنية المعلومات ودورها في تنمية الموارد البشرية بجامعة المرقب
- دراسة الحل لمنظومة المعادلات التفاضلية الخطية باستخدام تحويل الزاكي
- أساليب مواجهة ضغوط الحياة اليومية لدى طالبات كلية التربية
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- صيد الأسماك في منطقة الخمس وأثاره الاقتصادية
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- Physical and Chemical Properties Analysis of Flax Seed Oil (FSO) for Industrial Applications
- Catalytic Cracking of Heavy Gas Oil (HGO) Fraction over H-Beta, H-ZSM5 and Mordinite Catalysts
- Monitoring the concentration (Contamination)of Mercury and cadmium in Canned Tuna Fish in Khoms, Libyan Market
- EFFECT CURCUMIN PLANT ON LIVER OF RATS TREATED WITH TRICHLOROETHYLENE
- Comparative study of AODV, DSR, GRP, TORA AND OLSR routing techniques in open space long distance simulation using Opnet

- Solution of some problems of linear plane elasticity in doubly-connected regions by the method of boundary integrals
- Common Fixed-Point Theorems for Occasionally Weakly Compatible Mappings in Fuzzy 2-Metric Space
- THE STARLIKENESS AND CONVEXITY OF P-VALENT FUNCTIONS INVOLVING CERTAIN FRACTIONAL DERIVATIVE OPERATOR
- Utilizing Project-Based Approach in Teaching English through Information Technology and Network Support
- An Acoustic Study of Voice Onset Time in Libyan Arabic



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ABSTRACT

Background & Aims: Curcumin (CCM), a plant phenolic compound, is widely used as a spice and coloring agent in food. Recently, CCM, had been considered to possess antioxidant activities. This study aimed to investigate whether CCM, protect against trichloroethylene (TCE)-induced hepatotoxicity and to demonstrate its possible mode of action.

Methods: A group of male rats were treated with TCE (5mg/1000 ml of drinking water) to induce liver injury. The CCM group was fed 25 g mixed with the diet (2.5Kg) concomitantly with 5 mg TCE/1000ml drinking water, for 8 weeks. The rat were killed after treatment period of 8 weeks, and samples of livers tissue were fixed immediately in 10% formalin.

Results: Histopathological changes

It was obviose that TCE administration has shown dramatic injures in the liver tissues, and the treatment with curcumin can activate these injures to advanced level.

Introduction

Nowadays, there is an increasing interest in the protective function of dietary antioxidants, which play important role in the protection against oxidative stress. CCM (diferuloyl methane) is a phenolic compound present in large quantities in the root of plant *curcuma longa*. It has been widely used as a spice and coloring agent in food. Recently, CCM has been considered to possess anti-inflammatory and antioxidant activities (Anto et al., 2000). The ability of CCM to prevent tumor formation in the skin , forestomach, duodenum, and colon of mice and in the tongue, colon, mammary glands, and sebaceous glands of rats had been well documented (sharma et al., 2001).

CCM has been also shown to inhibit lipid peroxidation caused by many toxic agents in hepatocytes either *in vitro or in vivo* (Ramirez Bosca et al.,1995; Devasena et al., 2002). On the other hand, no treatment-related toxicity was observed up to an oral dose of 8000 mg/day for 3 months in mice (Chuang et al., 2000). This non-toxic nature of CCM, as well as its multiple beneficial clinical effects, has made it one of the most attractive antioxidants.

TCE is a major environmental contaminant, especially in drinking water, which provokes occupational and general concern for the population because of its widespread use and designation as a probable

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human carcinogen (IARC, 1995). TCE induces free radical-mediated oxidative tissue damage that eventually leads to a high incidence of acute toxicity or tumors in the liver and kidney of humans and rodents (Lash and parker, 2001). It has been shown that the amount of TCE and the period needed for the occurrence of hepatic injury in mice were 600-2400mg/kg/day, via gavage, for 4 weeks (Merrick et al., 1989), 500-2000mg/kg/day orally for 28 days (Goel et al., 1992), and 2.5-5.0 mg/ml of drinking water for 4-8 weeks (Griffin et al., 2000).

The present study was thus designed to investigate the protective activity of CCM, against TCE-induced liver injury.

Materials and methods

Chemicals: Pure TCE was purchased from Sigma Chem. Co.(St. Louis, MO, USA). Powdered CCM, was purchased from Libya spice market. Histopathological examinations and microscopical pathology have been carried out in Zoology Department, Damietta Faculty of Science, Mansoura University.

Diets: Standard diet was prepared from Casein(20%), Starch (32%), Sucrose (33%), Cellulose (5%), Corn oil (5%), and Vitamin / Mineral (5%), (Abd-Allah ,2003).

Animals and Treatments:

15 males albino Wistar rats (weight range 58 – 160 g) were used for the experimental study. Animals were obtained from Helwan animal station, Ministry of Health, Egypt . The experimental rats were housed in the animal house in zoology Department, Faculty of Science, Damietta Branch, Mansoura University, New Damietta, Egypt . They were housed in plastic cages under controlled temperature.

- Experimental animals were divided into 3 groups of 5 rats each.

Group 1 : (Normal) rats were given basal diet and water for 8 weeks.

Group 2 : (Trichloroethylene) rats were given 5% TCE in drinking water for 8 weeks.

Group 3 : (Trichloroethylene + Curcumin) rats were given 5% Trichloroethylene in drinking water and Curcumin at 25 g mixed with the diet (2.5Kg) for 8 weeks.

histopathological examination

After 8 weeks of treatments, rats were killed by Anesthesia and Liver was fixed in 10 % formalin for histopathological examination and the routine heamatoxylin and eosin staining technique. The specimens

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were washed under running tap water over night to remove the formalin. They were dehydrated in ascending series of alcohol, processed through xylene-alcohol and then cleared in two changes of xylene, 30 minutes each. They were transferred into a mixture of xylene and melted paraffin for 1 hour and then into two pure paraffin changes, 30 minutes each for infiltration. The specimens were embedded in pure paraffin to form blocks. Serial sections were cut at a thickness of 5 microns using rotary microtome. Sections were stained in haematoxylin and eosin according to Drury and Wallington (1967). Histopathological examinations and microscopical pathology have been carried out in Zoology Department, Damietta Faculty of Science, Mansoura University.

RESULTS**Liver histopathology:**

Histopathological changes in the liver of rats treated with curcumin, and Trichloroethylene were studied after 8 weeks of treatment.

A - Normal liver:

Section of normal rats showed the normal structure of the liver tissue. The main structural component of the liver is hepatocyte. These hepatocytes are disposed in plates that are interconnected in such a way to show, in the light microscope sections, structural units, the liver lobules. The liver lobule is formed of a polygonal mass of tissue with centrally located central vein and some portal spaces at the periphery of the lobule, each containing a veinule (a branch of the portal vein); an arteriole (a branch of the hepatic artery); and ductile (part of a bile duct system (figures 1,2).

B. Liver of treated rats:

The following are demonstrated in liver of treated rats.

1. Histopathological finding in the liver of TCE- treated rats:

Histopathological examination of the liver sections of Trichloroethylene treated rats showed necrosis , fibrosis and hyperplasia in most of the portal areas is seen in all examined livers (figure3). Also, lymphatic infiltration, in most of the portal areas is seen in all examined livers (figure4).

2. Histopathological findings in the liver of CCM- treated rats:

Administration of curcumin to TCE treated rats showed marked improvement in liver tissue structure as can be observed by decreased the degree of necrosis . The sections of the liver from rats treated CCM to TCE showed inflammation (figure5) Also Dilatation (figure 6).

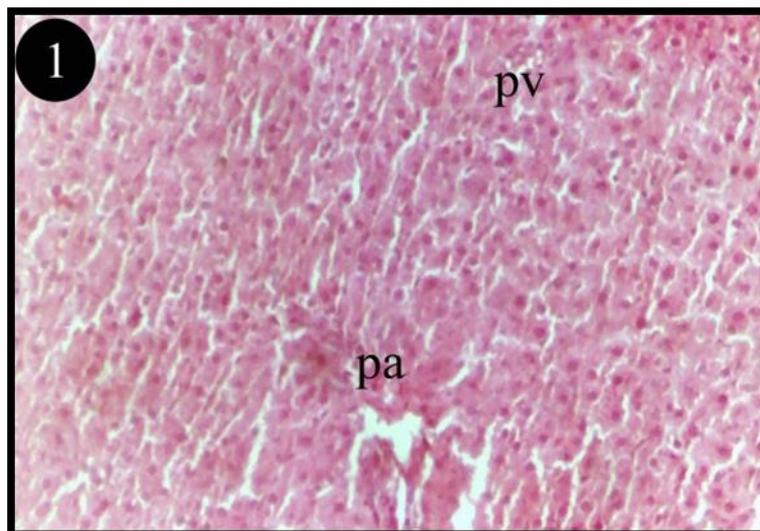


Fig. 1 : A photomicrograph of the liver of normal rats showing normal structure. Note: Pa, Portal artery and pv, portal vein. (Haematoxylene and eosin stain, Magnification X20).

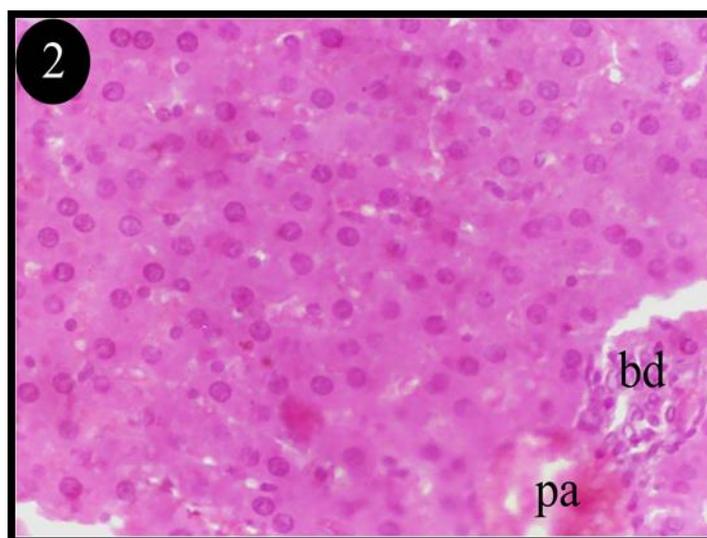


Fig. 2 : A photomicrograph of the liver of normal rats showing normal structure. Note: Bd, Bile duct and pa, Portal artery. (Haematoxylene and eosin stain, Magnification X40).

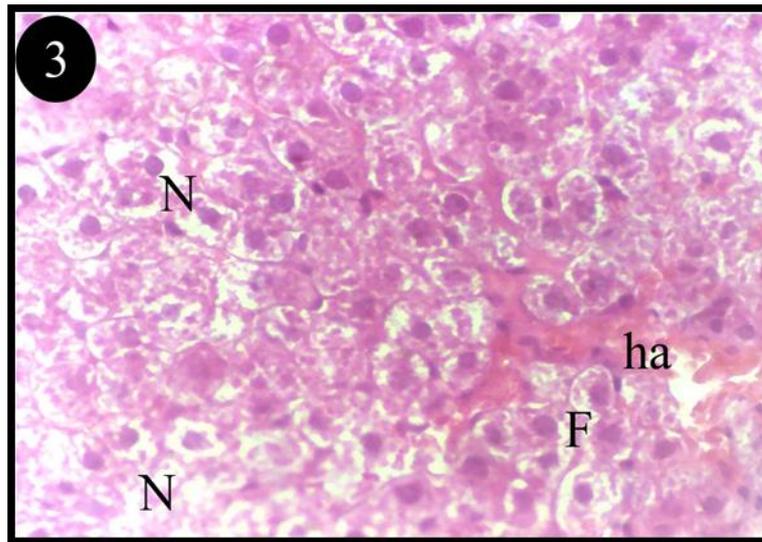


Fig. 3 : A photomicrograph of the liver of TCE-treated rats showing focal necrosis of hepatocytes (N), the presence of fibrotic tissues (F) and hayperplasia (ha). (Haematoxylene and eosin stain, Magnification X40).

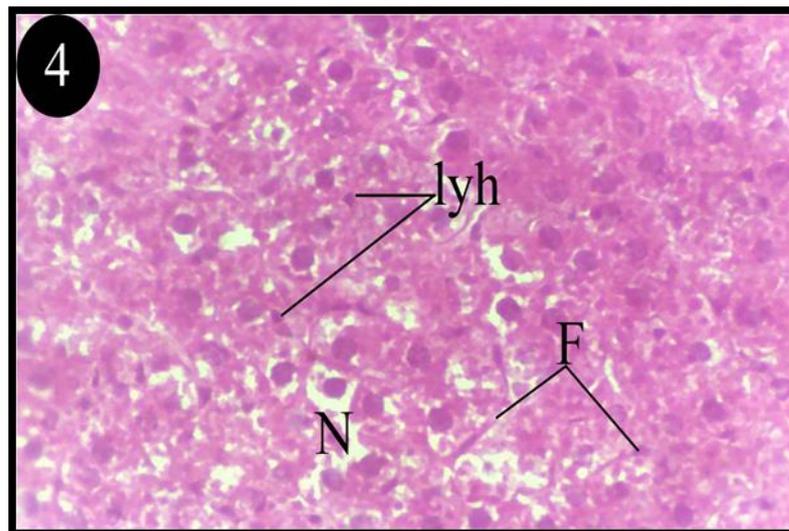


Fig. 4: A photomicrograph of the liver of TCE-treated rats showing focal necrosis of hepatocytes (N), the presence of fibrotic tissues (F) and lyedig cell hyperplasia (lyh). (Haematoxylene and eosin stain, Magnification X40).

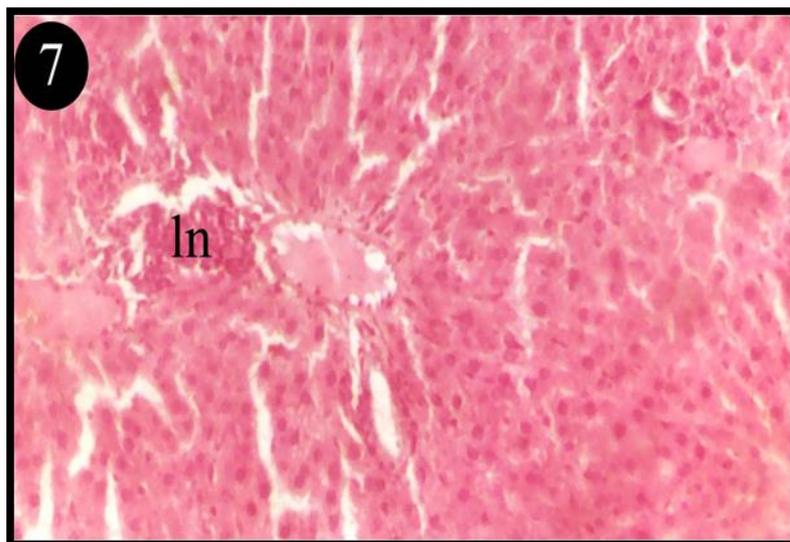


Fig. 5 : A photomicrograph of the liver of Curcumin and TCE-treated rats showing collection of lymphocytic inflammatory cells. (Haematoxyline and eosin stain, Magnification X20).

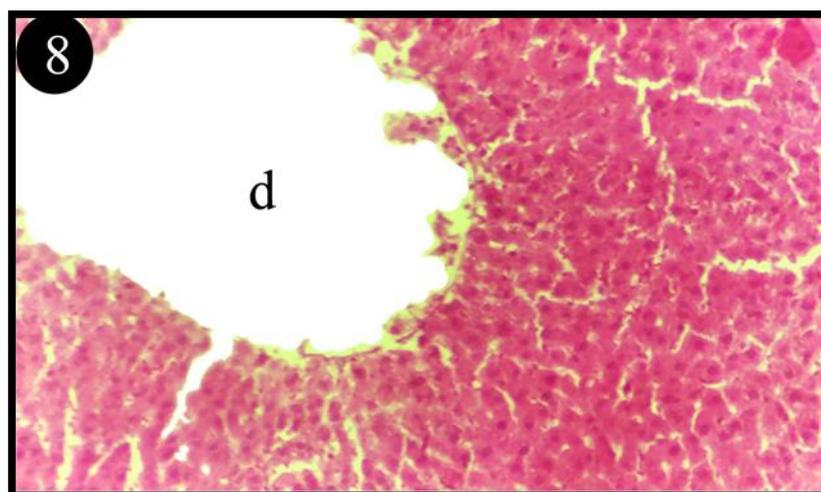


Fig. 6: A photomicrograph of the liver of Curcumin and TCE treated rats showing dialated central veins. (Haematoxyline and eosin stain, Magnification X20).

Discussion

Many histopathological changes in the liver may be induced in rats treated with TCE. In the present study, TCE treated rats showed necrosis, fibrosis, hyperplasia and lymphocyt infiltration of the liver.

These results are in agreement with that of Stulnig et al. (2002) which showed necrosis, inflammatory infiltrations of the livers obtained from TCE. In addition of Elcombe et al. (2002) reported the liver cell

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enlargement (hypertrophy) in the rat, but both hypertrophy and hyperplasia (cell proliferation) in the mouse (after TCE administration by gavage for 10 consecutive days, at doses of 500 to 1500 mg/kg body wt) were observed. Also, Melnick et al. (2004) showed that individual cell necrosis in the liver, and hepatic microsomal NADPH cytochrome c reductase and peroxisomal palmitoyl-CoA oxidase and catalase activities were found in both the dosed-fed and gavage groups. When add Gelatinsorbitol microcapsules containing 44.1% trichloroethylene (TCE) were prepared and mixed in NIH-07 rodent meal diet and provided at microcapsule concentrations of 0 (untreated control group), 1.25, 2.5, 5.0, or 10% (equivalent to 0, 0.55, 1.10, 2.21, or 4.41% TCE, respectively) to groups of 10 males F344 rats for 14 days.

After treatment with curcumin histopathological examination has revealed that there was only dilatation in portal central veins in liver fed with curcumin, concomitantly with TCE.

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يشترط في البحوث العلمية المقدمة للنشر أن يراعى فيها ما يأتي :

- أصول البحث العلمي وقواعده .
- ألا تكون المادة العلمية قد سبق نشرها أو كانت جزءا من رسالة علمية .
- يرفق بالبحث تزكية لغوية وفق أنموذج معد .
- تعدل البحوث المقبولة وتصحح وفق ما يراه المحكمون .
- التزام الباحث بالضوابط التي وضعتها المجلة من عدد الصفحات ، ونوع الخط ورقمه ، والفترات الزمنية الممنوحة للتعديل ، وما يستجد من ضوابط تضعها المجلة مستقبلا .

تنبيهات :

- للمجلة الحق في تعديل البحث أو طلب تعديله أو رفضه .
- يخضع البحث في النشر لأولويات المجلة وسياستها .
- البحوث المنشورة تعبر عن وجهة نظر أصحابها ، ولا تعبر عن وجهة نظر المجلة .

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