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## **EFFECT OF GARLIC EXTRACT IN RABBITS LIVER TREATED BY CARBON TETRACHLORIDE**

**Abstract:** *The study was conducted on 56 domestic rabbits, It was divided into five groups (8 control rabbits and 12 in each experimental group). The experimental was dosed aqueous garlic extract in doses of 5, 10mg/kg and dissolved carbon tetrachloride in olive oil 2ml/kg. The level of hepatic enzymes was investigated in two stages, and a histological study was conducted at the end of the experiment.*

*There was a clear increase in the level of enzymes (AST, ALT, ALP) and bilirubin of rabbits blood of toxic and treatment groups at the end of the fourth week of the experiment, whereas the data of the two preventive groups were closer to the normal state. The histopathological results were compatible with the enzymatic changes, as the pathological changes were evident in the liver tissue of the two groups B and E, whereas the liver tissue changes in the tow preventive groups (C and D) are less severe and closer to the normal structure.*

**Key words:** *rabbits liver, garlic, CCL4.*

## **ВЛИЯНИЕ ЭКСТРАКТА ЧЕСНОКА В ПЕЧЕНИ КРОЛИКОВ, ОБРАБОТАННЫХ ЧЕТЫРЕХХЛОРИСТЫМ УГЛЕРОДОМ**

**Аннотация:** *Исследование было проведено на 56 домашних кроликах. Оно было разделено на пять групп (8 контрольных кроликов и 12 в каждой экспериментальной группе). Экспериментально дозировали водный экстракт чеснока в дозах 5, 10 мг / кг и растворяли четыреххлористый углерод в оливковом масле 2 мл / кг. Уровень печеночных ферментов был исследован в два этапа, и гистологическое исследование было проведено в конце эксперимента.*

*В конце четвертой недели эксперимента наблюдалось явное повышение уровня ферментов (AST, ALT, ALP) и билирубина в крови кроликов токсической и лечебной групп, тогда как данные двух профилактических групп были ближе к нормальное состояние*

*Гистопатологические результаты были совместимы с ферментативными изменениями, так как патологические изменения были очевидны в ткани печени двух групп В и Е, тогда как изменения ткани печени в профилактических группах (С и D) менее выражены и ближе к нормальной структуре.*

**Ключевые слова:** *печень кролика - чеснок - CCL4.*

## **1. Introduction:**

The liver is exposed to many pathogens and toxicity [1], and contains high concentrations of metabolism enzymes that convert harmful substances, into less toxic molecules, and excrete them [2].

CCL4 is the chemical most used experimentally to cause hepatic damage and release free radicals, causing increased oxidative stress and lipid peroxidation. [3].

Despite significant advances in medicine and modern pharmacy, the medications used to treat the liver have many side effects. What called for continuous investigation and possible measures to protect or treat it using some types of medicinal plants [4]. Like as garlic, which is one of the most common herbs used and consumed as food and therapeutic substances and is known for its immunomodulatory activity and its role as an antioxidant. Garlic contains sulfur compounds, Tanins, Alkaloides and Saponins [5].

Researchers continue to strive to discover the benefits inherent in garlic, as it [6] discussed its protective role against cancer drugs and protecting the liver from apoptosis with the effect of cyclophosphamide.

[7] He studied the protective effect of reduced garlic oil for elevation enzymes and hepatic toxicity due to the effect of CCL4 in mice. As for [8], he investigated the therapeutic effect of garlic, against the hepatotoxic renal effects of gentamicin (such as fibrosis, seborrhea, necrosis and degeneration of the glomeruli).

## **2. aims:**

Investigate the preventive and curative efficacy of aqueous garlic extract against the toxic effect of carbon tetrachloride on the liver, based on liver enzymatic functional changes.

## **3. Materials and Methods:**

a) Preparing the aqueous extract: The aqueous extract of the garlic plant was prepared according to the method followed by [9], the garlic was peeled, sliced and homogenized 100 g garlic 200 ml water, crushed with a mixture, filtered, distributed in glass dishes and dried at a temperature of 45°C. The solid material was taken and concentrations were prepared from it Required.

b) The research was conducted on 56 rabbits of both sexes, with an average weight of about 750 g, and at the age of 3-4 months, placed in metal cages, and provided clean water and appropriate food with constant monitoring. Rabbits were distributed in five groups (8 rabbits in the control group and 12 rabbits in Each group) was dosed as follows:

Natural control group (A) were given olive oil 2ml/kg twice per week, and group (B) drank the toxic drug CCL4 dissolved in olive oil V: V twice a week 2ml/kg, group (C) diced garlic at a concentration of 5mg/kg per day, and group (D) garlic At a concentration of 10mg/kg, both groups C and D were treated with CCL4 two hours after giving the extract. And group (E) was given CCL4 twice a week 2ml/kg for two weeks, then garlic extract 10 mg/kg per day.

The experiment lasted for two months. Blood samples were drawn directly from the heart using a medical syringe end-of-weeks (4,8) to perform enzymatic tests and measure the ratio of ALP, ALT, AST and bilirubin.

Rabbits were dissected at the end of the experiment and tissue sections were prepared according to method [10] and examined by light optical microscopy for comparison.

## **4. Results and discussion :**

### **- Biochemistry changes :**

i. ALT Activity (Alanine Aminotransferase):

A gradual rise in the level of the enzyme appeared in the fourth week, which was more evident in groups E and B, compared to the rise in the values in the preventive groups C and D, which remained closer to the normal state, and this rise continued after that in groups E and B, but in the two prevention groups, it was The values were lower and close to normal values and the lowest level of elevation was in the protective group D. The elevation of ALT is due to liver cell damage and is usually accompanied by elevated AST and ALP. This is due to the activity of free radicals in cells membranes and the production of lipid peroxide that leads to cellular damage and leakage of enzymes into the blood [11].

ii. AST Activity (Aspartate Aminotransferase):

These values began to increase from the normal levels at the end of the fourth week in groups E and B, and this increase was more pronounced in the same two previous groups at the end of the eighth week, where group E showed the highest value, while the values in the preventive groups were almost normal until the end of Experience.

iii. Activity of ALP (Alkaline phosphatase):

The level of the enzyme in groups E and B increased, and this increase continued to increase until the end of the experiment as a result of liver injury and cholestasis and the release of large quantities of this enzyme [12] ., In the preventive groups, the rise was slight and specifically in group C, while the group data remained D within normal limits.

iv. Measuring Total Billirubin Ratio:

There was a gradual rise in the total bilirubin values for the blood samples of groups E and B, and this rise appeared clearly at the end of the fourth week, and these values reached their highest height in the same groups at the end of the eighth week. While it remained within the normal limits in the prevention groups C and D. (The following tables show changes in enzymatic values during the trial weeks).

Table (1) shows changes in serum enzyme values for rabbits during the fourth week of the experiment:

	A	B	C	D	E
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ALT	44.29±2.76	141.65±11.22*	86.77±7.04*	84.90±5.44*	166.18±14.60*
AST	24.34±3.26	132.29±7.23*	75.40±9.15*	72.13±6.38*	147.61±4.41*
ALP	38.70±12.95	122.57±16.29*	83.29±9.60*	79.45±9.18*	131.51±10.60*
Billirubin	0.35±0.09	1.79±0.17*	0.77±0.07*	0.68±0.05*	1.96±0.13*

Table (2) shows changes in serum enzyme values for

rabbits during the eighth week of the experiment:

	A	B	C	D	E
ALT	42.84±2.42	267.93±11.23*	98.31±15.60*	93.67±7.50*	321.70±7.85*
AST	33.12±5.31	245.27±14.14*	86.04±11.82*	83.54±9.82*	312.24±5.25*
ALP	45.17±8.42	201.44±6.29*	103.40±9.23*	95.71±7.15*	212.65±8.46*
Billirubin	0.38±0.03	3.72±0.08*	1.24±0.08*	1.06±0.09*	4.62±0.07*

#### - **Histological study:**

The histopathological results showed a clear compatibility with the enzymatic changes. Group B sections showed severe damage to the tissue structure of the liver (Figure 2). While the tissue in groups C and D was close to the normal state, especially in group D, it was noted that the return of cells to regularity despite the continued expansion of the central vein (Figure 3, 4), and samples of group E were the most subversive among the experimental groups (Figure 5)

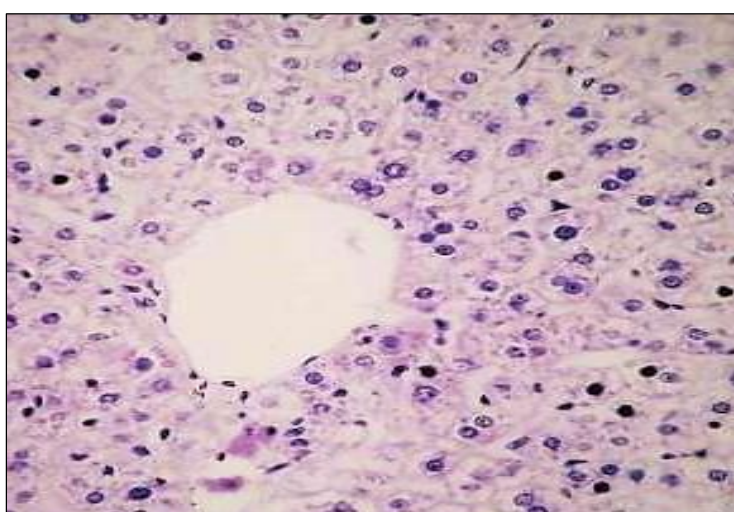


Figure1: A cross-section of a control liver sample showing the central vein and around it the endometrial cells. X400 (H&E)





Figure 2: Group B expansion of the sinuses DS, necrosis Ne, fatty degeneration f, Kupffer cells k. X400 (H&E)

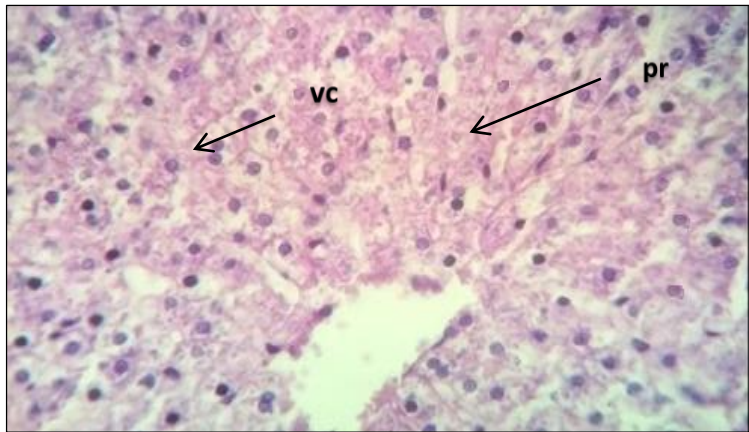


Figure 3: Group C Radial Structure Disorder, Some Protein Degenerations Pr and Evolution Vc. X400 (H&E)

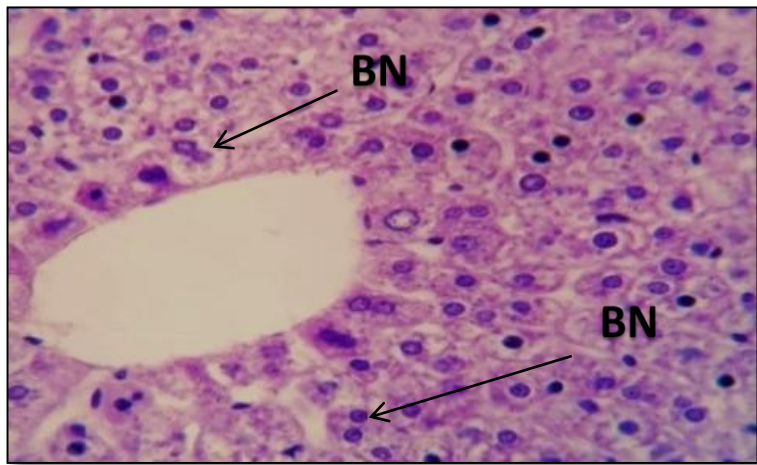


Figure 4: Group D the tissue is very close to normal and the multiplication of some nuclei BN. X400 (H&E)

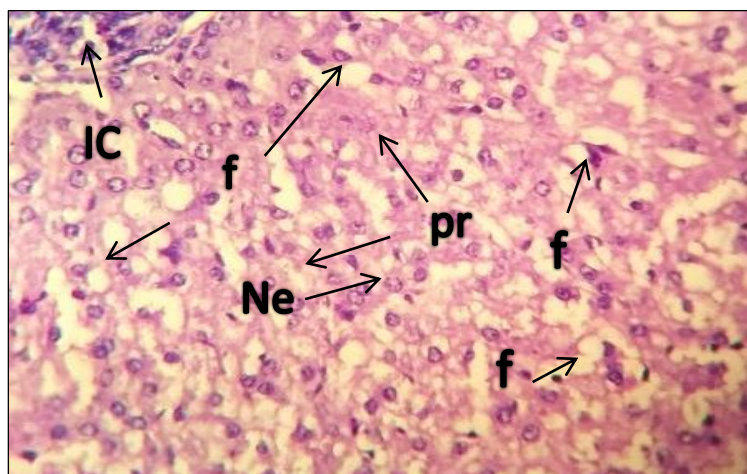


Figure 5: Group E: lipid degeneration f and protease Pr inflammatory cells IC, cell necrosis Ne .X400 (H&E)

Altogether ( biochemically and histologically) observed the hepatotoxic effect of CCL4, and the unclear clinical effect of dose and duration applied in this experiment. While the protective effect of garlic extract with the used doses was better, especially for the higher dose, the study of the level of enzymes ALT, AST, ALP, and bilirubin showed a decrease in the samples of the protective groups C and D compared to the toxic group B, and the results were closer to normal. This was confirmed by the results of examinations of tissue sections of group D at the end of the experiment and showed the return to normalization of liver cells and sinuses and the decline in pathological changes.

These biochemical and histological results were consistent with the findings of [13] who studied the effect of garlic oil preventive against hepatotoxicity caused by CCL4. And with a result [8] that indicated that garlic oil had an effect in reducing liver enzymes, after giving rats gentamicin to cause liver damage .

The results of this study on the protective effect of garlic also agreed with the findings of [14] that garlic tablets have a preventive effect from histological sabotage in the liver and kidneys caused by the lead acetate dose, and what has been concluded [15], which showed that garlic has a better protective effect than the effect. Therapeutic hepatotoxicity.



## 5. Conclusion:

As a result of this study, it was found that aqueous garlic extract had protective properties at the doses used, while no therapeutic effect was shown

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