Effect Of Annona Muricata Fruit And Turmeric combination on some biophysiological and histological parameters In CCl_4-induced Liver Injury In Rats

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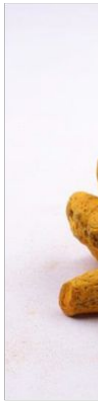
Introduction

- Medicinal plants are important part of health care.

- Approximately 70–80% people worldwide depend on medicinal plants to cure various human ailments including viral diseases.



- Moreover, herbal drugs have gained much importance due to their easily adaptability, low cost and fewer side reactions on patients.

• Curcuma longa L. (Turmeric, Curcumin) perennial herb
•Family: Zingiberaceae
•Nation: Tropical and subtropical regions the principal curcuminoid of turmeric, are natural phenols (9). There are two other curcumoids obtained from *C. longa* are desmethoxycurcumin (DMC) and bis-desmethoxycurcumin (BDMC ,

•Annona muricata L. (soursop, graviola)
•Family :Annonaceae
•Nation : warmest tropical areas in south and north America, India, Malaysia and Nigeria, a fruit that commonly known as graviola or soursop). The most important phytochemicals isolated and characterized from this plant include annonaceous acetogenins, lactones and alkaloids; tannins, coumarins .
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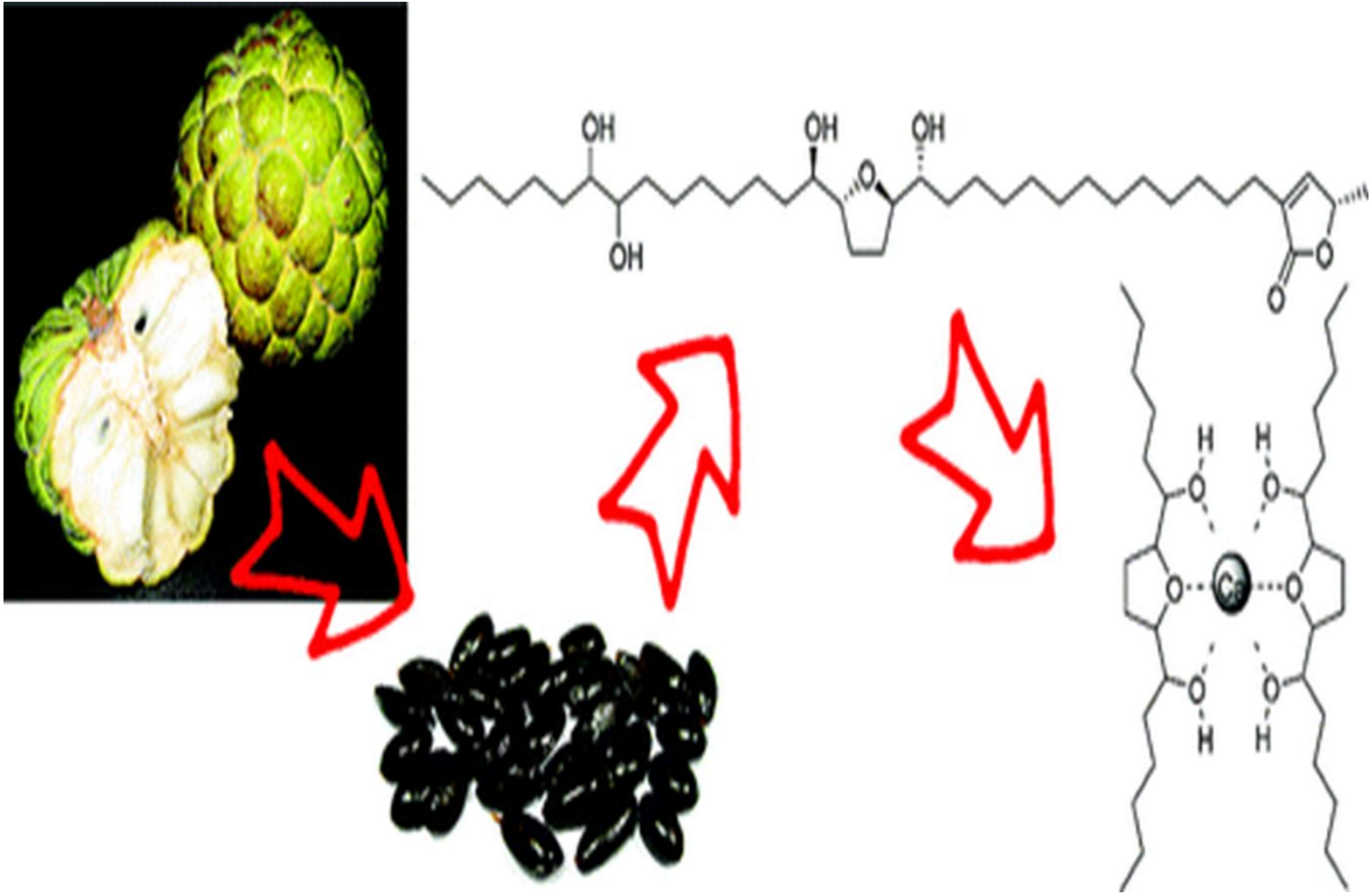
Biochemical action of acetogenins

❖Studies shown that acetogenins are inhibitores of complex I of the oxidative phosphorylation chain there by block the formation of ATP, the energy it needs cell cancer to operate pump P-glycoprotein mediated. The acetogenins also inhibit-ubiquinone oxidase, NADH-dependent enzyme that is peculiar to the plasma membrane of the cell cancerous , The acetogenins derived long chain fatty acids have direct action on mitochondria, the ATP, the Golgi reticular apparatus and plasma membranes and cell selectively destroying cancer cells without harming healthy cells Protect and increase the immune system. Acetogenin are monotetrahydrofuran


OH
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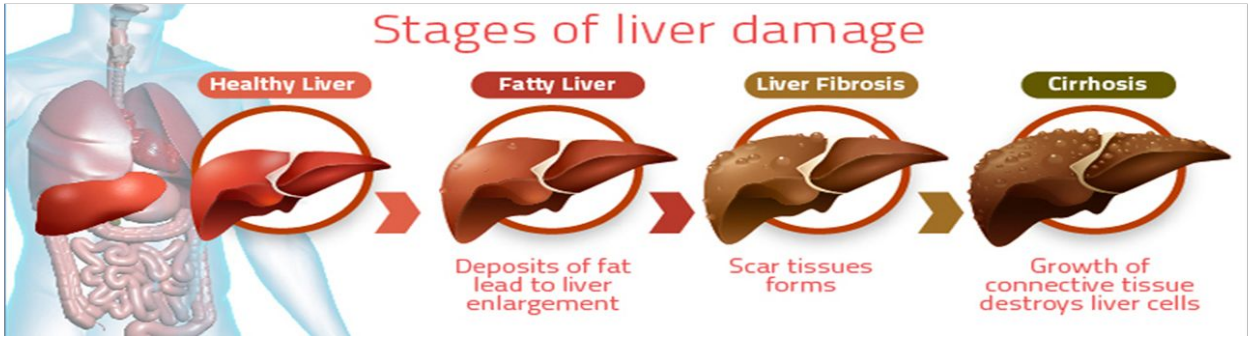
Based on these properties Curcumin and Annona muricata combination have a number of therapeutic properties including antioxidant activity, induction of tumor cell apoptosis, protection against lipid peroxidation by maintaining the activation of antioxidant enzymes like superoxide dismutase, catalase, and glutathione peroxidase at higher levels ,also suppression of protein kinase activation, and reduction of metalloproteinase expression .

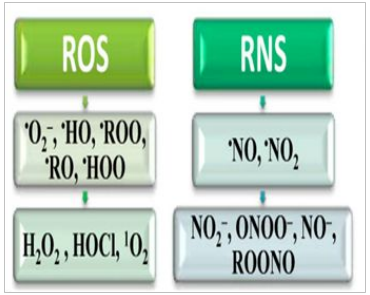
- Liver diseases are one of the major causes of mortality and morbidity worldwide.

- Drug-induced liver toxicity is a major cause of hepatic dysfunction. An estimated 1000 drugs have been implicated in causing liver injury.

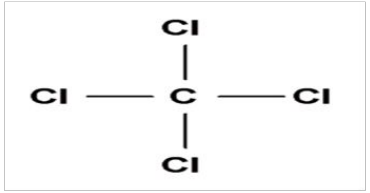
- Oxidative stress is considered as a mechanism in contributing to the initiation and progression of hepatic damage in a variety of liver disorders.



- Oxidative stress refers to the situation of serious imbalance between production of reactive species and antioxidant defense. It result from diminished antioxidants and increased production of (ROS) and (RNS).



Carbon tetrachloride: is a hepatotoxic solvent that produces several biochemical effects on animal organs.



Natural antioxidants can protect the body against the adverse effects of CCl_4 and some other toxins.

Aim of the study

1. Study the antioxidant and hepatic protective activity of **Annona Muricata Fruit And Turmeric combination In CCl_4-induced Liver Injury In Rats**

A. Determine the levels of Superoxide dismutase

B. Hydroxyproline, as oxidative stress and antioxidant markers

2. Study some hematological parameters in CCl_4 treated groups.

3. Study the effects of **Annona Muricata Fruit And Turmeric combination** with respect to the histological and ultrasructual alterations in **CCl_4-induced Liver Injury** rats.

Materials and Methods

Plant Preparation

* The fruit of Soursop (*Annona muricata* L.) was collected from the local market of Erbil. Fruit was washed, peeled and cut into tiny pieces and then liquidized into the soursop fruit extract(SFE) using blender. The SFE was stored in glass bottles and preserved in a refrigerator at2-4Co until used for experiment

*Turmeric (*Curcuma longa* Linn) sample was collected from the local market of Erbil. Dry turmeric was ground into powder by a blender and suspended in water then given to rats.

Experimental Design

* 40 Male Rats **(Four groups)**

*4 Weeks

*Annona treatment

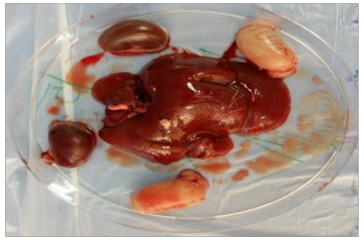
Control
olive oil

CCl_4
1ml/kg b.w.

* Annona and Turmeric treatment

- At the end of the experiment
  - ❖ Anesthetized
  - ❖ Blood collected
  - ❖ Dissected
    *Liver

Tissue homogenization
Histological section



Serology

Liver function test

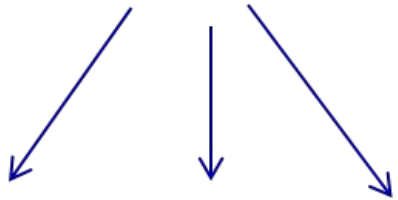
AST

ALT

ALP

D. Bilirubin

Hematology



PLT LYM WBC

(Automated haematology analyzer)

Tissue

GSH

Liver

Spectro.

HYP

Liver

ELISA

SOD

Liver

ELISA

Histology

Results

4.1. Effect of Annona and Annona with Turmeric on the Liver function tests in Carbon tetrachloride treated Rats

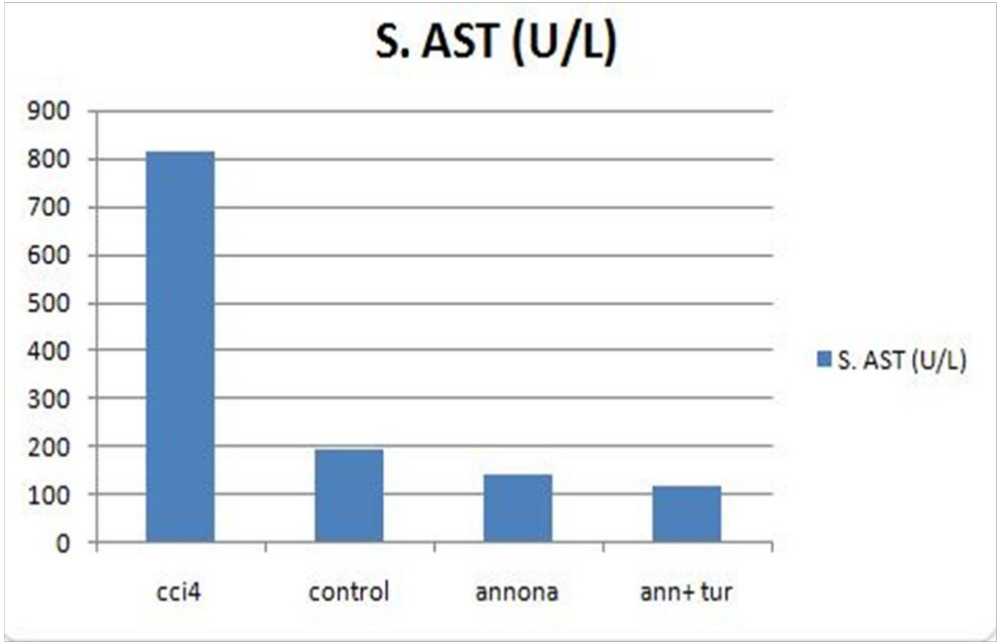


Figure 4.1: AST levels in CCl_4, control, annona, and annona with turmeric treated groups

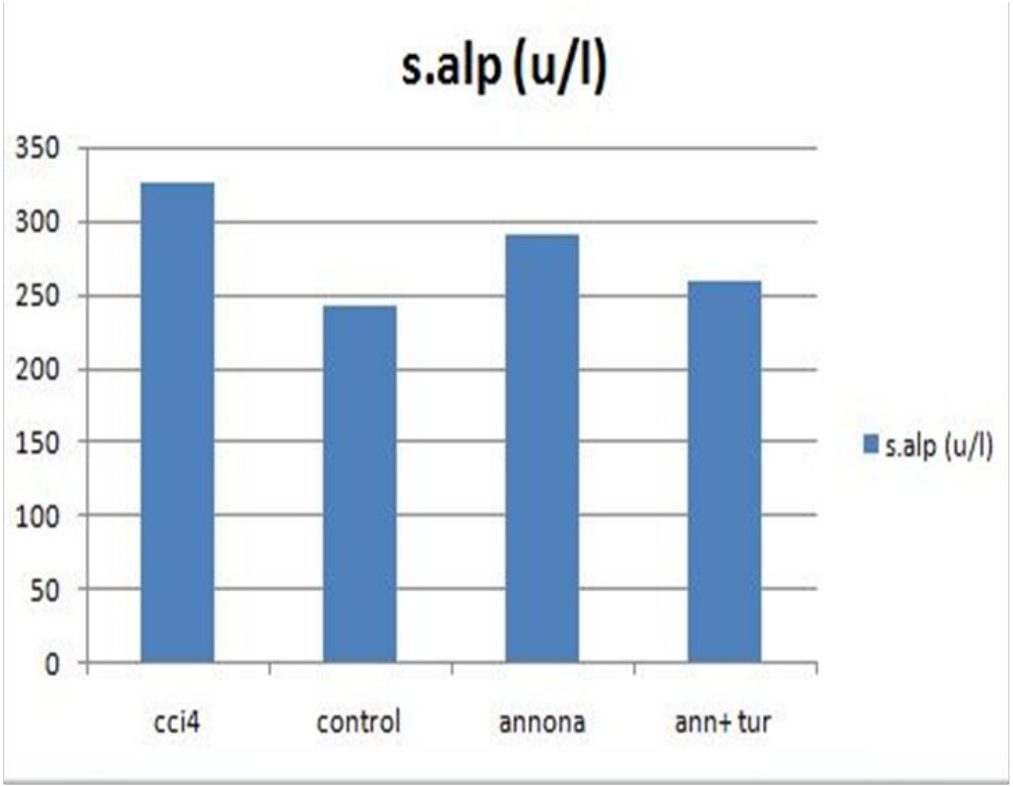


Figure 4.2: ALP (U/L) levels in CCl_4, control, annona, and annona with turmeric treated groups

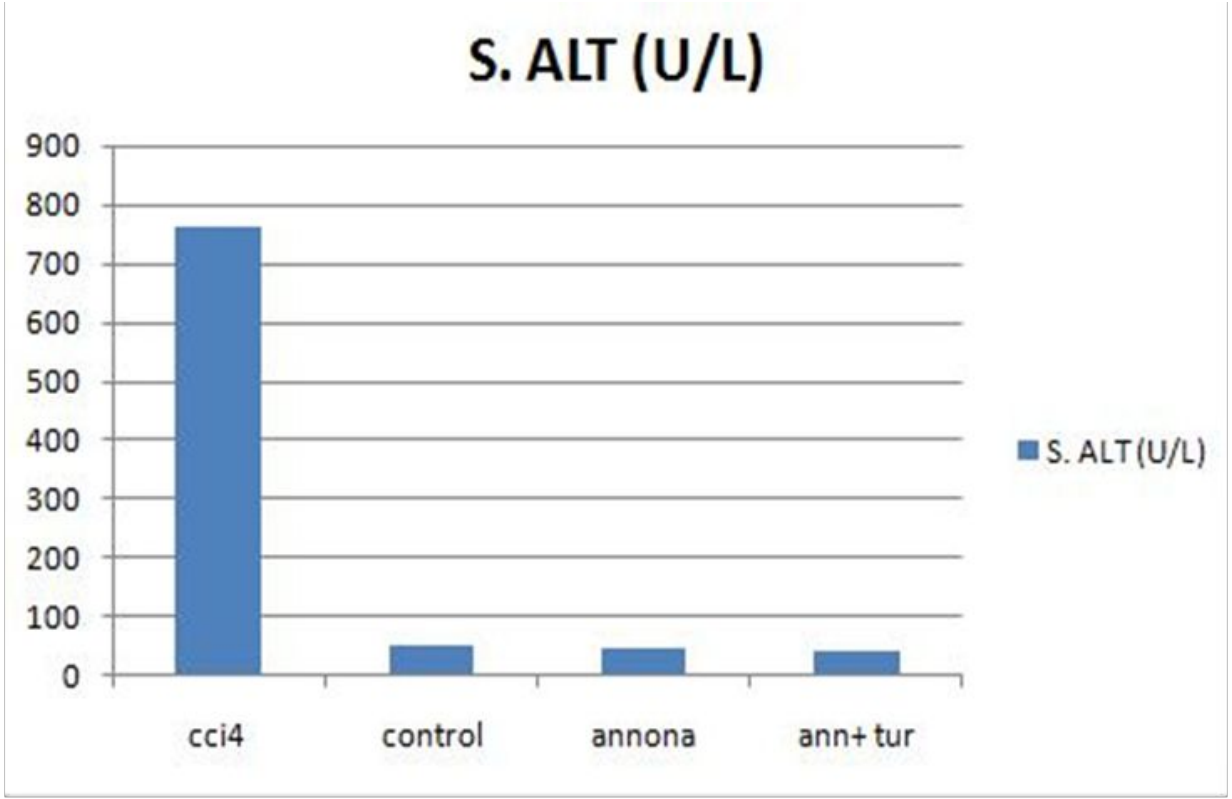


Figure 4.3: ALT (U/L) levels in CCl_4, control, annona, and annona with turmeric treated groups

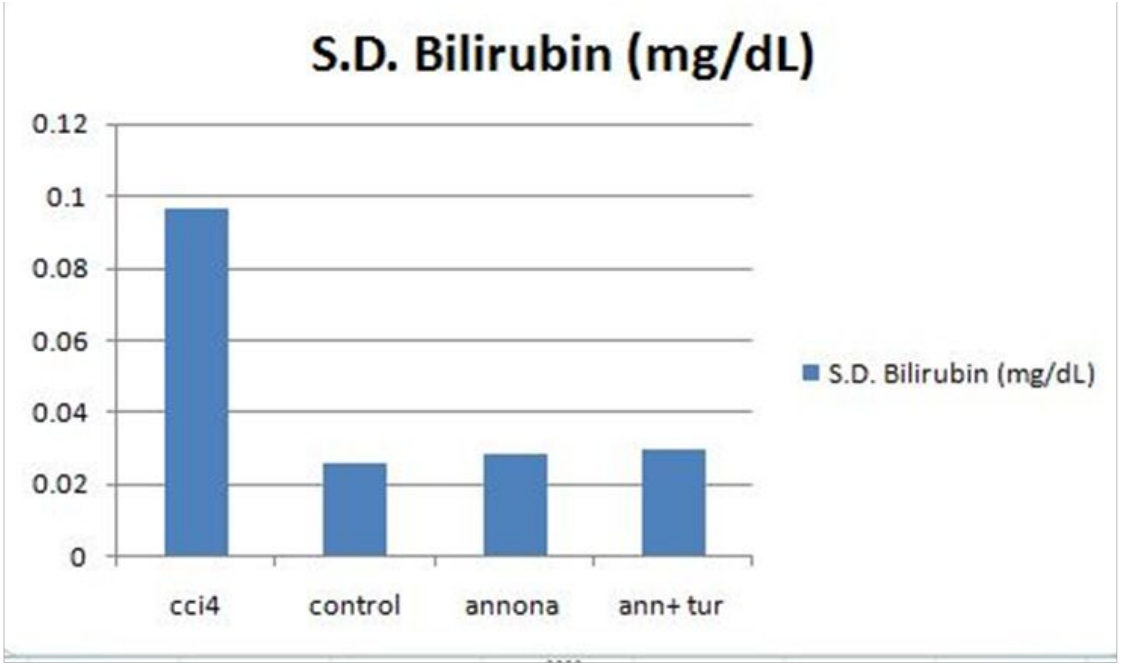


Figure 4.4: Bilirubin (mg/dL) levels in CCl_4, control, annona, and annona with turmeric treated groups

4.2. Effect of Annona and Annona with Turmeric on the Liver Superoxide dismutase, Hydroxyproline and Glutathione levels in Carbon tetrachloride treated Rats

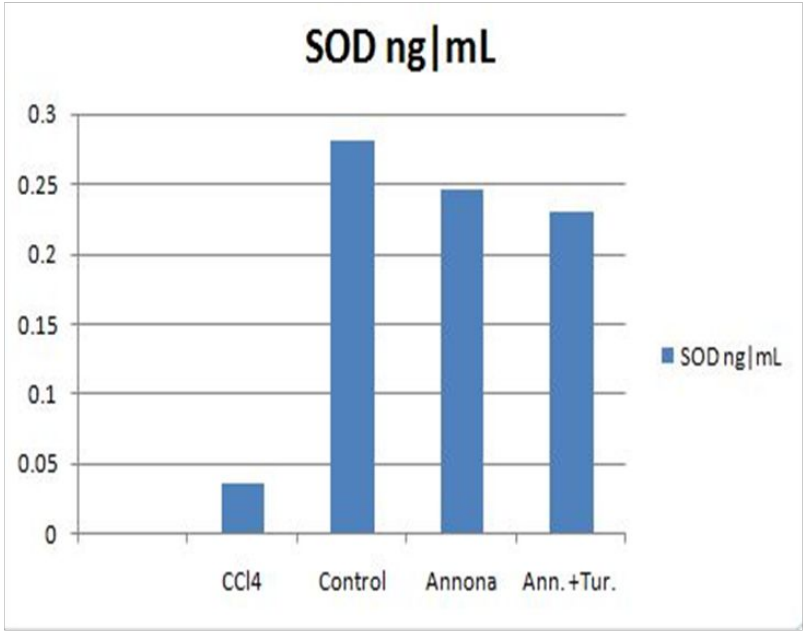


Figure 4.5: Liver SOD levels in CCl_4, control, annona, and annona with turmeric treated groups

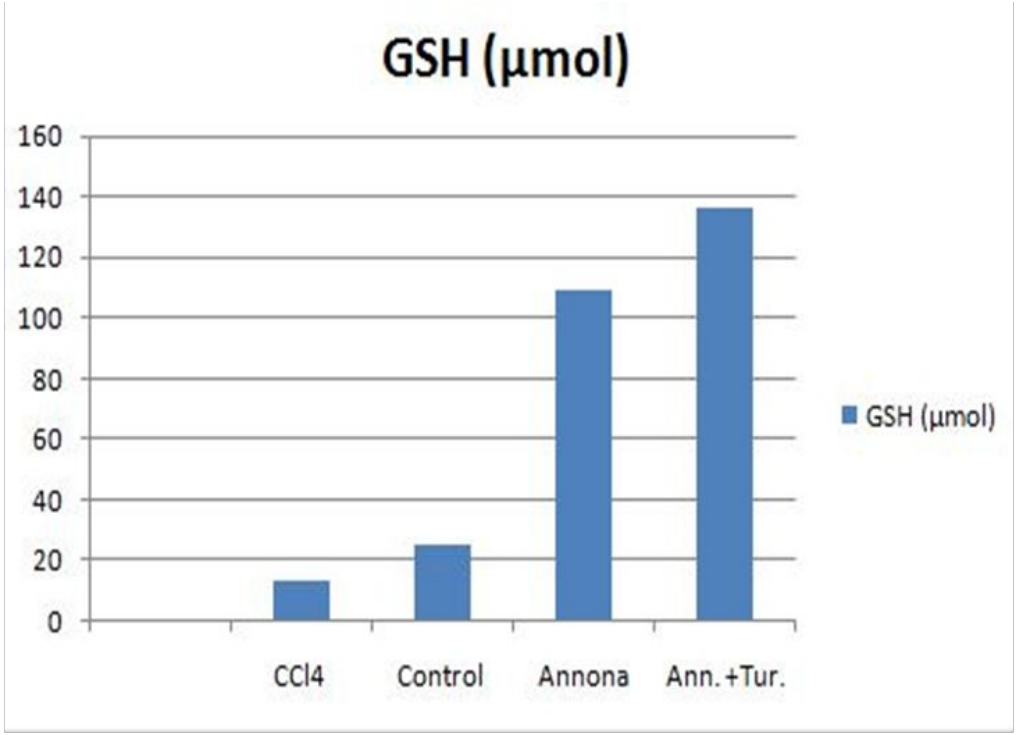


Figure 4.6: Liver GSH levels in CCl_4, control, annona, and annona with turmeric treated groups.

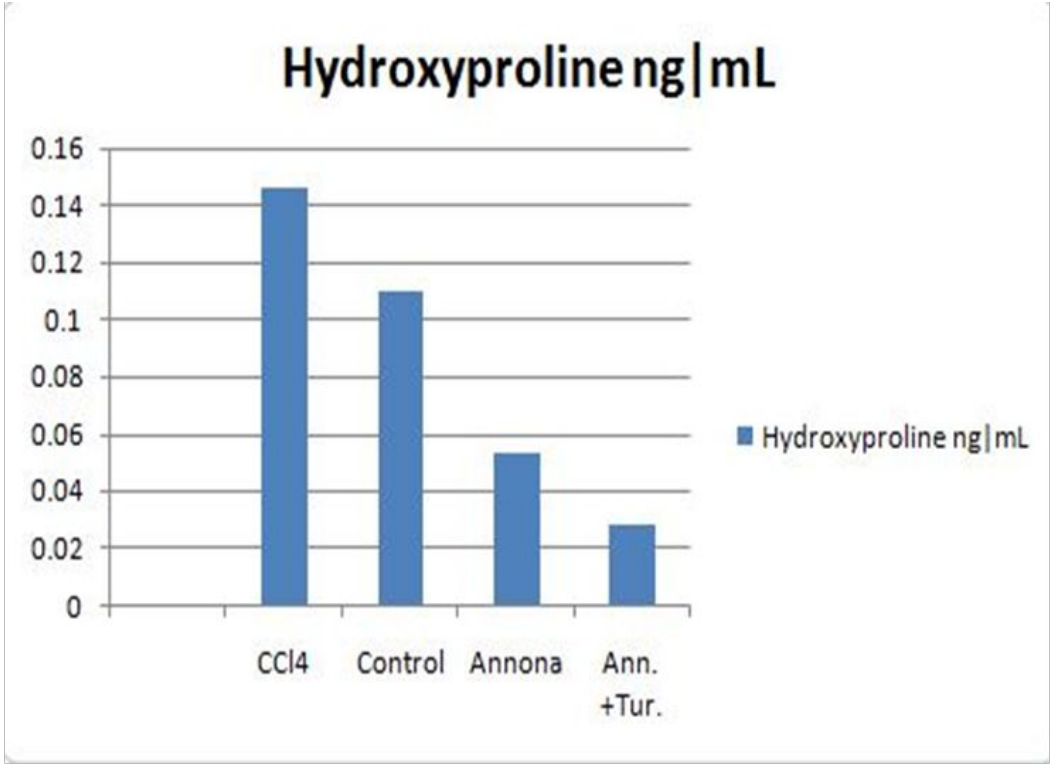


Figure 4.7: Liver HYP levels in CCl_4, control, annona, and annona with turmeric treated groups

4.3. Effect of Annona and Annona with Turmeric on the some Hematological Parameters in Carbon tetrachloride treated Rats

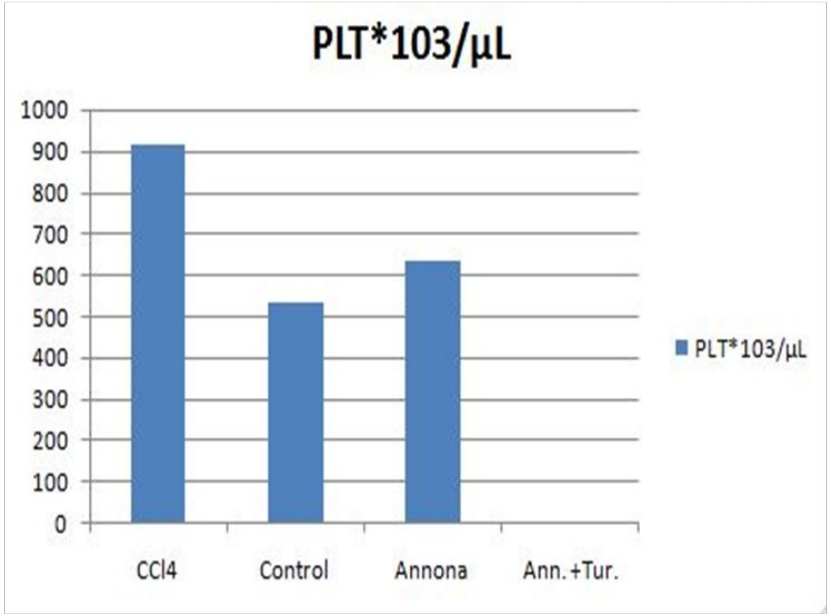


Figure 4.8: PLT levels in CCl_4, control, annona, and annona with turmeric treated groups

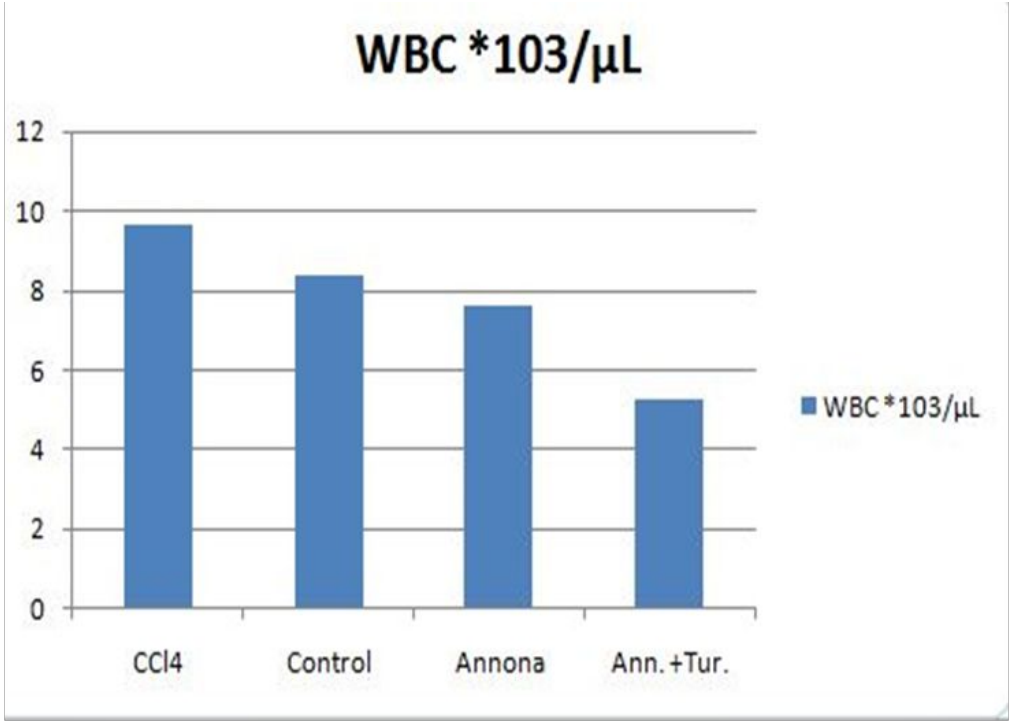


Figure 9: WBC levels in CCl_4, control, annona, and annona with turmeric treated groups

4.5. Histological Sections of Liver

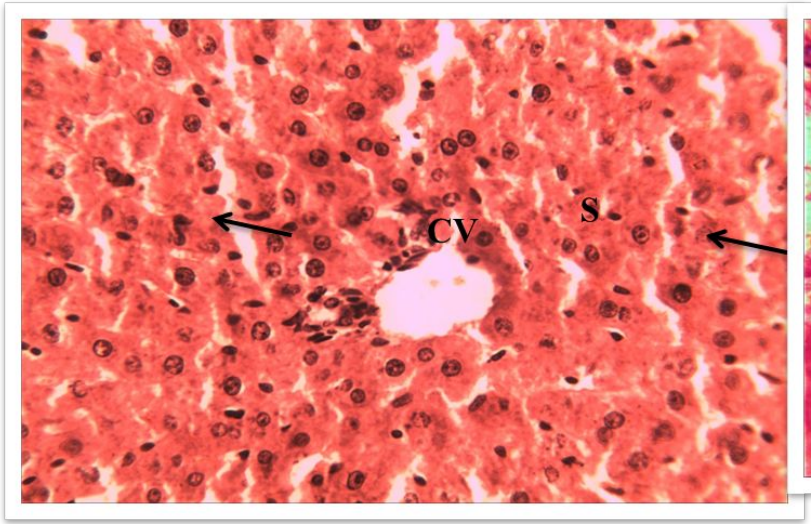


Figure 3.: Histological section through the liver of control rat showing normal architecture of hepatocytes (black arrow) which polyhedral in shape with obvious nucleus, blood sinusoids (s) and central vein CV. 400X, H and E.

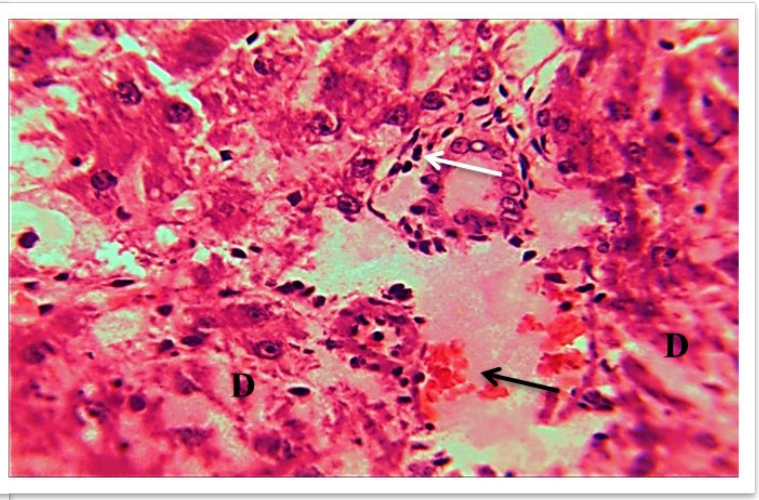


Figure 4: Paraffin section of the rat liver treated with CCl_4 in which most of the hepatocytes were degenerated (D), congestion of blood (black arrow) and inflammatory leukocyte infiltration (white arrow) were observed 400X, H and E.

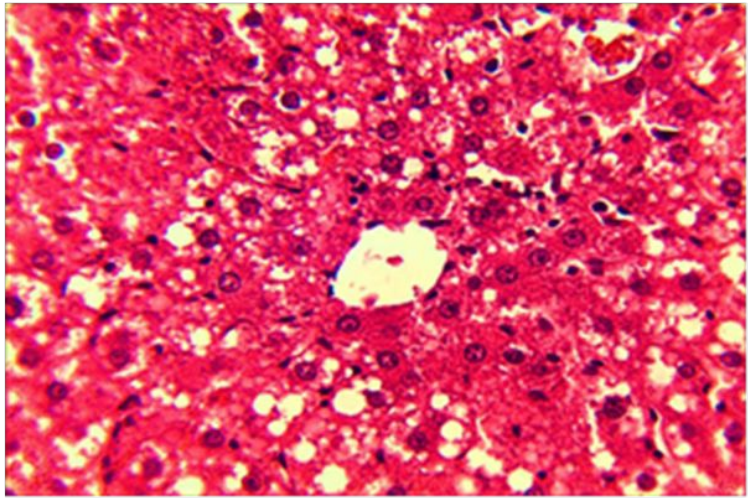


Figure (5) light microscopic examination of the rat liver showed vacuoles (V) and few degenerated hepatocytes (black arrow) as a result of treatment with CCl_4 and annona 400X, H and E

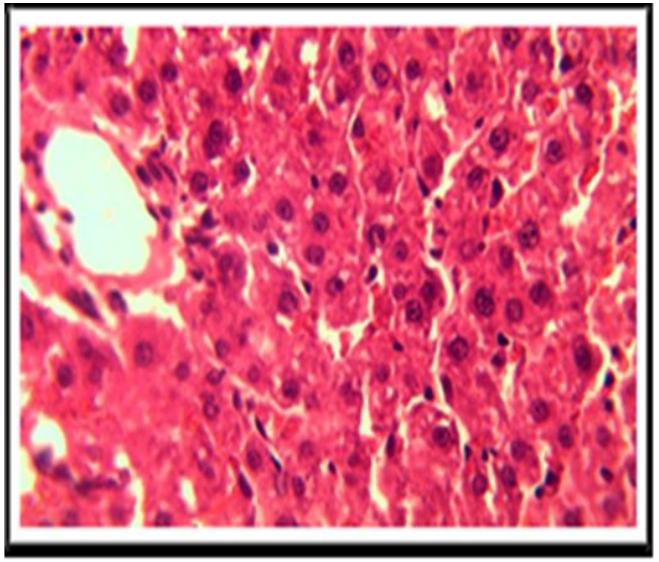


Figure (6): Photomicrograph through the rat liver treated with CCl_4 and combination of annona with turmeric. Most of hepatocytes were appeared normal but a few of them were degenerated and few vacuoles still noted 400X, H and

Thanks for Your Attention