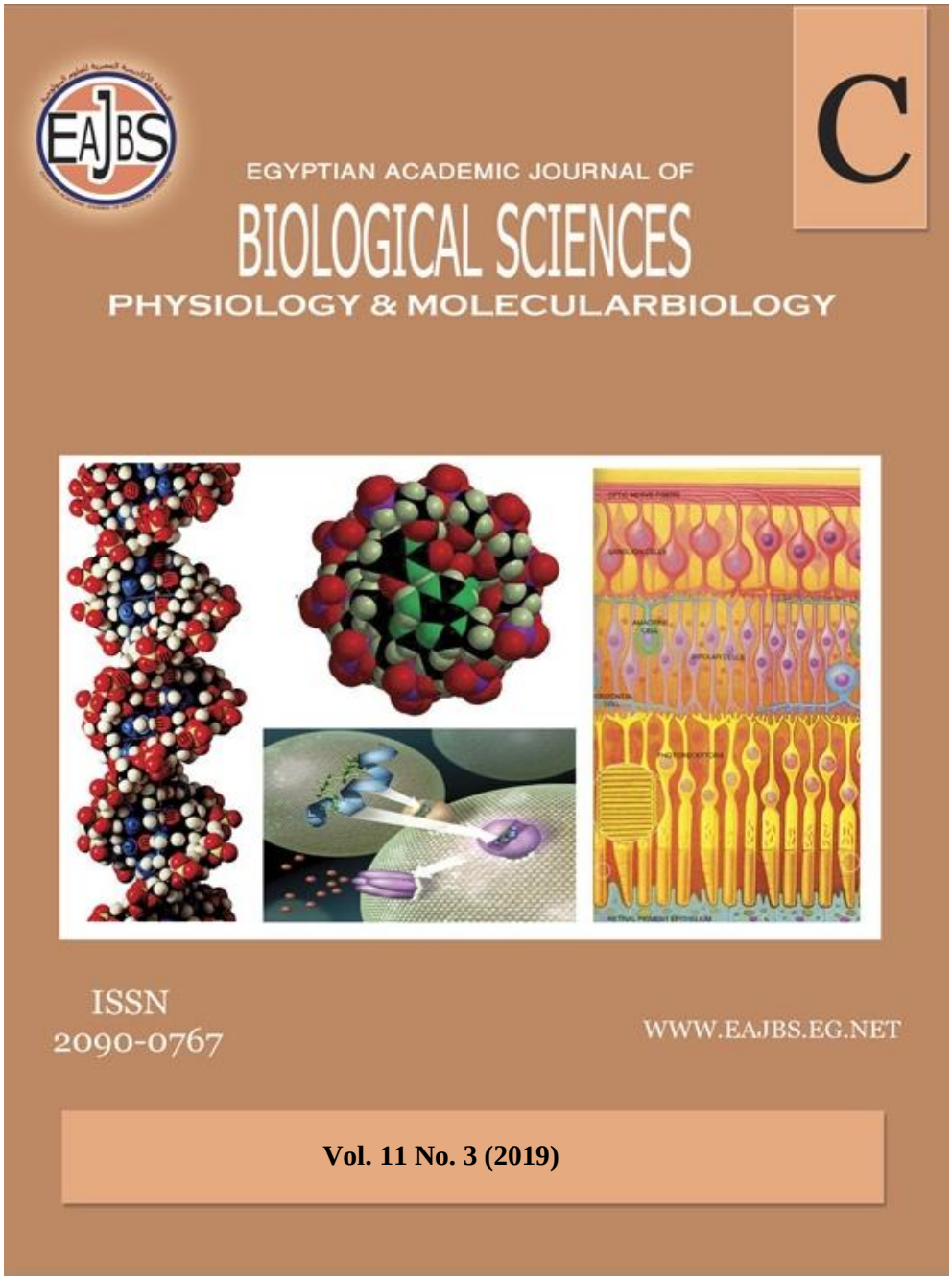

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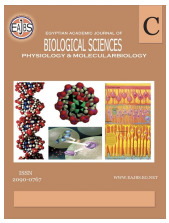

Effect of Carrot Juice on Some Blood Parameters in CCl4 intoxicated rabbits

Intisar. H. Abdullah
Zoology department, faculty of science, Sirte University –Libya
E.Mail: intisar.ahmad@yahoo.com

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ABSTRACT

The purpose of this study was to evaluate the beneficial effects of *Daucus carota* root juice on carbon tetrachloride (CCl_4) intoxicated rabbits. In this study, fifteen rabbits divided into 3 groups... The first group (G1) served as the control, the second group (G2) was treated with CCl_4 , and a third group (G3) was treated with CCl_4 +extract of *Dacus Carota* roots .

Carbon tetrachloride alone caused a non-significant ($P<0.05$) increase in WBCs, RBCs, Hb and HCT compared with G1. and non-significant decrease in PLT was observed in CCl_4 treated group compared with G1. Administration of *Daucus carota* roots juice to CCl_4 G3 shown a significant ($P<0.05$) increase in the HCT, WBCs, PLT and non- significant change in RBCs and Hb.

INTRODUCTION

Carbon tetrachloride (CCl_4) is largely used as a solvent in many industries, CCl_4 is also frequently used to induce oxidative stress in experimental animals (Shyu ,2008) . Although most of the puplished data on the toxicity of CCl_4 focus on liver, recent studies demonstrate that the liver is not only targeted organ for CCl_4, but also other organs such as kidneys(Ganie *et al*., 2011). Lungs (Khan *et al* .,2010; Sahreen *et al* ., 2014) heart (Sahreen *et al* ., 2013) testes (Ahmad *et al.*, 1987) and blood (Abraham *etal*., 1999) . the kidney has a higher affinity to CCl_4 than liver(Ronis *et a*l ., 1988) due to the predominance of cytochrome P-450 in the renal cortex (Khan *et al* ., 2009) .

In addition, many studies in vitro and vivo demonstrated that CCl_4 can decrease the ratio of renal reduction/oxidized glutathione, microsomes and mitochondria while inducing an increase in lipid peroxidise in kidney (Adewle *et al* ., 2007 ; Maran *et al* ., 1991).

Daucus carota commonly known as carrot is one of the most important vegetables belonging to family *Apiecea I* an annual or biannual herb mostly confined to the temperate regions of Europe , Asia and Africa,its active ingredients including volatile oils , steroids , tannis flavonoids, and carotene have been isolated (Jasicka *etal* .,2005; Vasudevan *etal.*, 2006; Yu ll *etal.*, 2005) carrot seeds are rich with antioxidants (Fuhraman *et al* ., 2000) . carrot contains carotenoids which are natural pigments with lipophilic properties and antioxidant characteristic. (Sesso etal., 2006; Hozawa *et al* ., 2006) the higher serum carotenoids concentration , the risk of diabetes and insulin resistance cab be caused by carotenoids function (Hartwell , 1971).

In traditional medicine carrots (*Daucus Carota*) have been used as treatments for leukaemia and other cancers throughout history (Zaini *et al* ., 2011) and have previously been studies in other contexts as potential sources of anticancer agents (Hassan *et al* ., 2013). The current study aimed at the effect of *daucus carota* juice on some blood parameters in rabbits intoxicated with CCl4.

MATERIALS AND METHODS

Experimental Animals:

Fifteen rabbits were randomly divided into three group (five rabbits/ group- rabbits body weight was 1.870-2.35 Kg) were used in this experiment at the laboratories of the zoology department, Sirte University. The rabbits were kept in a controlled environment and were allowed free access to standard chow died and water during experiment

Chemical Materials:

Carbon tetrachloride from (Eurosta scientific limited) was used to induce acute liver injury in rabbits, while, fresh carrot roots used to make a carrot extract (juice).

Preparation of Carrot Roots Extract (Juice):

Carrot roots cleaned by water, chopped and put into the apparatus (Robert Bosch Haussgerate GmbH/ Type CNCJ02/ Slovenia) to make a juice without adding water.

Study Design:

The fifteen rabbits were randomly divided into three groups (five rabbits/ group) the juice dose was orally given using the gastric tube (5ml /Kg b.wt). rabbit body weight was equivalent to 16gms (Fahima, 2014). Fresh weight of the used carrot roots.

Group (G1) Control:

Five rabbits were orally intubated with 2ml distilled water for seven days and in day eight they were given 1ml olive oil (as a solvent for carbon tetrachloride).

Group (G2) CCl4 Treated Animals:

Five rabbits were orally intubated with 2ml distilled water for seven days and in day eight they were given a dose of CCl4 (1.25ml/ kg b.wt) dissolved in olive oil at a rate 50% (v/ v).

Group (G3) Carrot Juice +Ccl4 Treated Animals:

Five rabbits took 5ml / kg b.wt carrot juice for seven days and on day eight. They were given dose of CCl4 (1.25ml/ kg b.wt) dissolved in olive oil at a ratio of 50% (v/ v).

Haematological Tests:

Blood samples were collected from all groups of the experimental overnight fasten rabbits , the shed blood was collected in cleaned vials , (with EDTA) for haematology parameters , where the erythrocyte count(RBCs/ µl) , hematocrit (HCT%), platelets (PLTs/ µl), leukocyte count (WBCs/ µl), heamoglobine (g/ dl), were determined using an electronic blood counting machine (system R800)

Statistical Tests:

The results were analysed using SPSS . All values were recorded as Mean+ standards error of the mean, while the statistical differences between the means were determined by ANOVA, and the $P<0.05$ was accepted as significant level(Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Administration of CCl4 to the animals resulted in a marked-non-significant increase in WBCs, HCT, RBCs and Hb, and a non-significant decrease in PLT when compared with the G1. However , administration of *daucus carota* extract (juice) showed a non-significant increase in

RBC s, Hb, and HCT as compared to G3, oral administration of *daucus Carota* juice caused a significant elevation in WBCs and PLT as compared to G2.

Table 1: Values of WBCs, RBCs, Hb, HCT, and PLT count (Means±SE) for control and treated groups of rabbits.

Groups Parameters	G1 (Control)	G2 (CCl_4 treated)	G3 (D.carota +CCl_4 treated)
WBCs(x10³/ µl)	7.58±0.81	9.02±0.03	11.62±1.00*
RBCs(x10⁶/ µl)	5.88±0.26	6.18±0.67	6.27±0.44
Hb g/ dl	10.90±0.42	11.68±1.30	11.80±0.74
HCT%	37.18±1.26	37.86±3.93	39.02±2.21
PLT((x10³/ µl)	206.80±14.10	200.80±6.68	243.00±14.91

Values are given as mean ± SE for 5 rabbits in each group

a significant (P<0.05) as compared with the (G1)

b significant (P<0.05) as compared with the (G2)

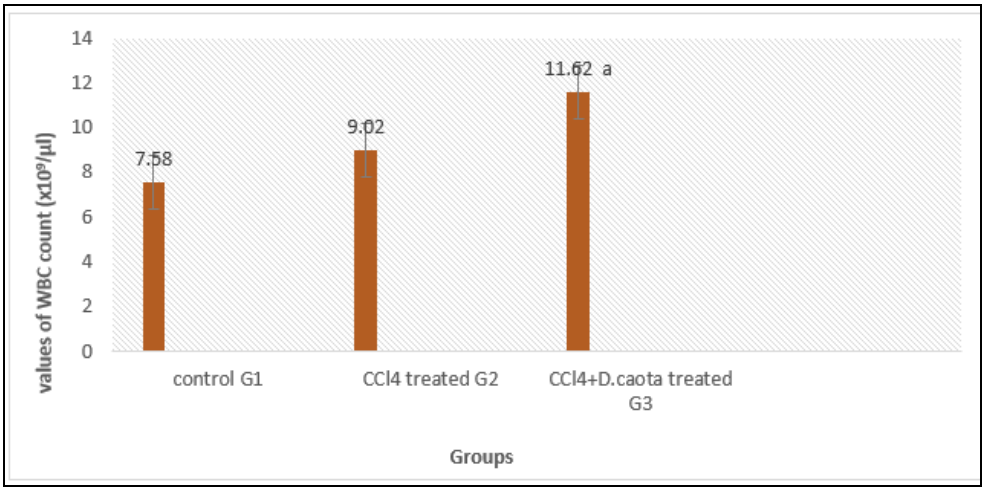

Fig. 1 : Values of WBCs count (Means±SE) for control and treated groups of rabitts.
[a] significat (P<0.05) as compared with the group II

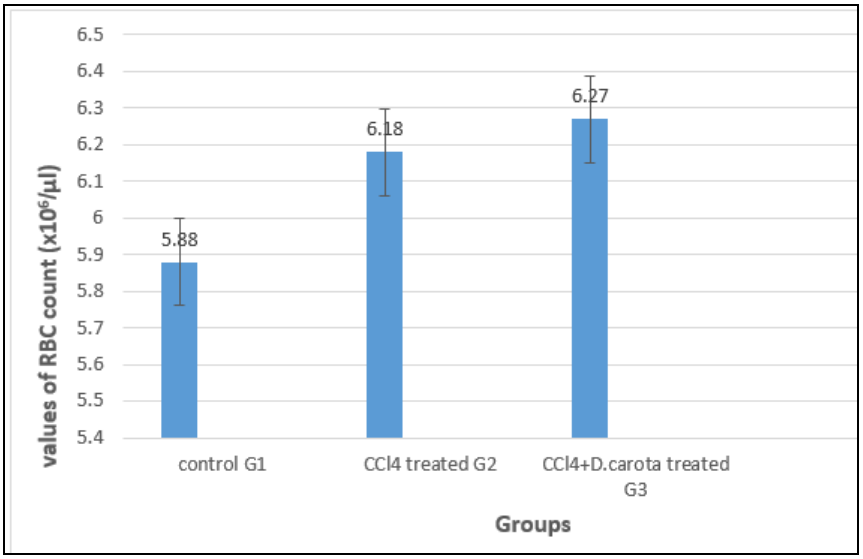

Fig. 2 : Values of RBCs count (Means±SE) for control and treated groups of rabitts.

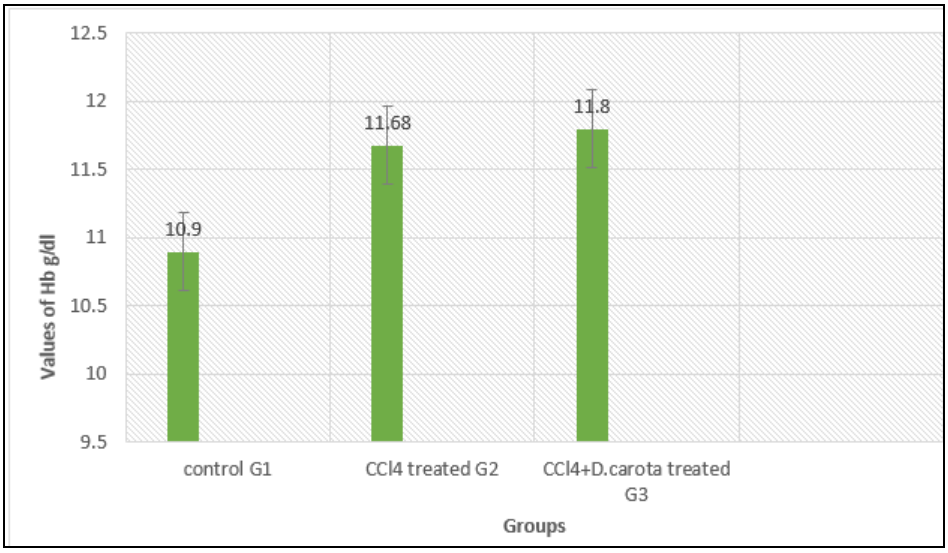

Fig. 3 : Values of Hb (Means±SE) for control and treated groups of rabitts.

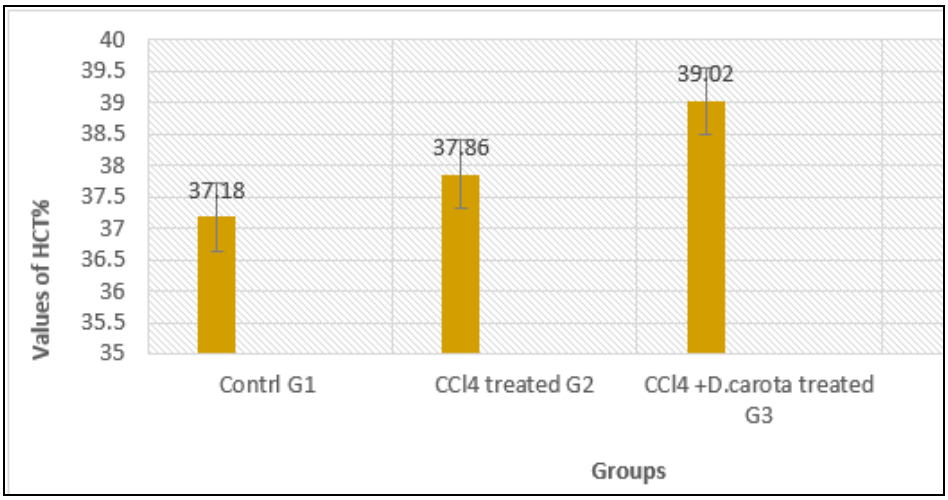

Fig. 4 : Values of HCT (Means±SE) for control and treated groups of rabitts.

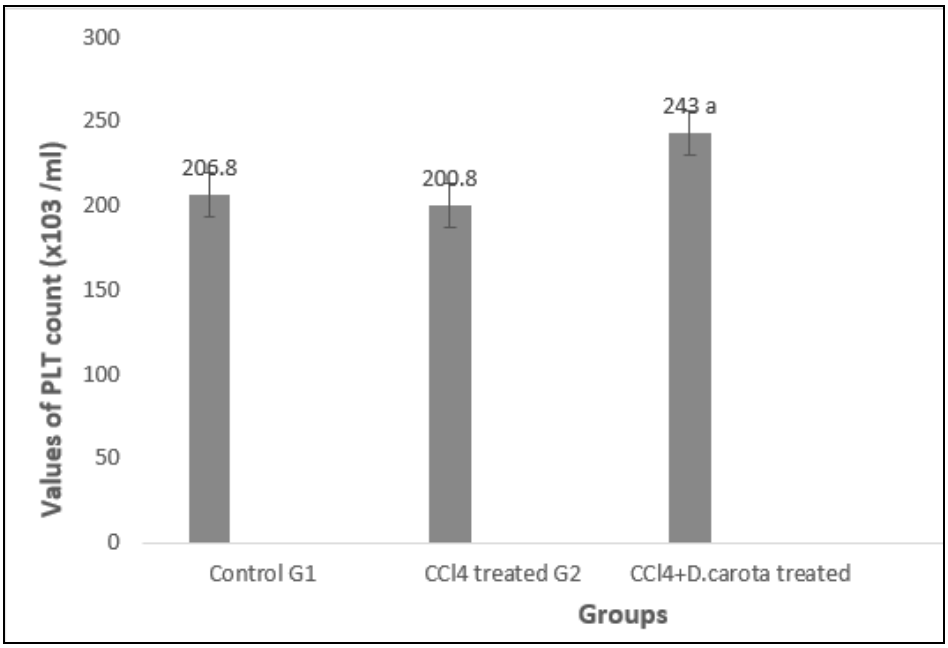

Fig. 5 : Values of PLT (Means±SE) for control and treated groups of rabitts
[a] significat (P<0.05) as compared with the group II

The administration of CCl4 may gravely alter blood composition{ Essawy *et al* ., 2010 ; Hocking, 1987 } it has been reported that renal failure is associated with abnormalities affecting haematological parameters such as erythrocyte count(RBCs/µl) , platelet (PLTs/µl), thrombopoiesis and immune function {Ganong, 1991}and this study CCl4 –treated animals showed increase in number RBCs. These results agreed with the finding of (Noris *et al* ., 1993), and this may be attributed to the reactivation of the erythropoiesis mechanism which is controlled by the circulating glycoprotein hormone erythropoietin, which secreted primarily by the kidney and liver (Witters *et al*., 2008) the increase in the number of erythrocytes in our results may be at the origin of the elevation of Hb . a decrease in PLT count or thrombocytopenia could be explained by damage affecting hematology function and the immune system platelet dysfunction is also thought to be caused by the action of uremic toxin following renal failure (Bashour , 2000).

The values of blood parameters of the present study namely WBCs, RBCs, HCT, and Hb showed a non significant change in treated rabbits whit CCl4 as compared to the control group ,but the decrease in PLT count of treated rabbits whit CCl4 as compared to the group control ,generally in the present study , the administration of D.carota caused a significant increase in WBCs, RBCs, Hb, HCT and PLT values as compared to the group II .the results provide strong evidence that D.carota is beneficial in protecting the kidneys from CCl4 toxicity many studies agreed with our results (Marounek *et al* ., 2010 ; Muriel *et al*., 2001 ; Althnaian *et al.*, 2013). These results were also observed by (Muriel *etal*., 2001 ; Althnaian *et al.*, 2013) who stated, that carrot contains volatile oils, and other materials such flavonoids, carotene and vitamin C which may contribute to explain its protective effect on organs.

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