The Effect of Aqueous Extract of Borago officinalis and Uranyl Acetate on lipid profile and in Albino males rabbits exposed to oxidative stress

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Abstract

The effect of aqueous extract of Borago Officinalis and uranyl acetate on activity in oxidation – antioxidants system was designed to estimate (MDA , GSH) as well as its effect on biochemical parameters (Total cholesterol ,triglycerides , low and very low high density lipoproteins to cholesterol , Glucose).

The study showed that given uranyl acetate produced a significant increment at level ($p \leq 0.05$) in each average of the Glucose , Total cholesterol ,triglycerides , LDL-C,VLDL-C and MDA as compared with control group. Whereas there was a significant decrement at level ($p \leq 0.05$) in each average of the HDL-C ,GSH as compared with control group . whereas the treatment of the albino males rabbits by uranyl acetate and aqueous extract resulted in a significant reduction at level ($p \leq 0.05$) as compared with uranyl acetate group only through the average of the Glucose , Total cholesterol , triglycerides , LDL-C,VLDL-C, MDA .Whereas increment in average of High Density Lipoprotein – Cholesterol and GSH .the treatment of the albino males rabbits by aqueous extract only resulted in a significant increment at level ($p \leq 0.05$) as compared with control group through the average of the Glucose , Total cholesterol , triglycerides , LDL-C,VLDL-C, MDA , and resulted in a significant decrement through the average of HDL-C and GSH .

Key words : *Borago officinalis*, Uranyl Acetate , oxidative stress

Introduction

The heavy minerals form the major part and the most common The environment pollution , through that heavy minerals considered dangerous threat and form a to the human health(1). The Uranium is the most dangerous as an element existing in nature and it is widely available in the environment due to the natural residues , the Nuclear factory precipitation , the coke burning and the other types of fuels. The surrounding material contain a few ratios of the radiant material but they have effects on the environment and their impact remains several years.

So they affected the human and animal genetically structure leading to the genetic defect that it is effect emerged in the next generation. In addition , the pollution impact spread in water and soil and then introduced in the feeding chain for the human beings and animals as well(2). So the study of the uranium esters in the environment in general and in human beings in particular are important and reflected the extent of spreading the uranium ester in the environment as

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well as their relationship with the strange diseases that showed after the heavy pollution in climate due to the wars. The uraniferous compounds are different in their solvent capacity in the atomistic liquids that have significant effects on healthy and some principle parts in body are as an obvious target to the uranical compounds such as the liver , kidney and the lymphatic parts such as the spleen as well as the thyroid gland when they affected the human being by the touching , rubbing and inhaling the gases(3) .

It is obvious that the using of the medical herbs and plants provided the best results as compared with the manufactured chemicals and then reduced their sides effects such as The Borage Officinalis plant that has several benefits and many medical uses like clearing the blood , balancing the working of glands , as well as a medicine sweating and treating the weaking cases and physical defects like the melancholy issuing from the psychological anxiety(4) .

The aim of the present study is to investigation the effect of Uranyl Acetate and Aqueous Extract of Borago officinalis on biochemical parameters and oxidation – antioxidants system in Albino males rabbits

Material and methods

Method of extracting the plant essence :

The Borage Officinalis plant was obtained from one of the herbalist – shop Tikrit city where was located in the traditional markets in form of the drying plant will whole parts and then the plant is recognized and prepared the raw aqueous extract by the infusion in the hot water according the used method by new well et al(5) without boiling the plant material .

The animals of the experiment :

The study uses 24 male adult albino male rabbits that weighed between 1450 – 1550 gram and the experiment was done during February in 2012 . The rabbits were divided into four groups , each group consist of 6 rabbits and each group was reserved in singular wooden cages in temperature degrees ranged between 25 – 28 Ċ and provided water and food continually with enough quantities until the experiment is conducting . The weighs of the animals were recorded at the beginning of the experiment and its end by using ordinary balance when the animals were after the ending the duration of the experiment the weighs of animals were measured after the treatment and then the samples of blood were taken by stabbing in their hearts to all the groups and the biochemical and enzymatic tests were done by using the kits and the chemicals employing in measuring some of the biochemical standards as glucose sugars , total cholesterol , triglycerides and the high , lower density lipoprotein as well as in measuring the concentrations of MDA and GSH.

The experimental groups :

The first group: as the control healthy group .

The animals were gave 5 ml from tap water orally for one month between a day and anther

The second group : (the group that treated with Uranyl acetates only)

Before the starting of dosing the animal , this group that the water was pulled from nearly (12) hours and then

they were dosed with Uranyl acetates concentrated 50 mg/kg(6).for one month between a day and another with (2) ml .

The third group : (the group treated with Uranyl acetates and with the aqueous extract of the Borage Officinalis).

The animals were gave the aqueous extract of the Borage Officinalis with concentration 10% with dose (5) ml and the dosing continues for two months.

The fourth group: (the group treated with the aqueous extract of the Borage Officinalis).

The animals were dosed the aqueous extract of the Borage Officinalis with concentration 10% with gave (5) ml and the dosing continues for two months.

Analytical statistics:

The result analyses for programme to used (SAS , 2001) one – way analysis of variance at a significant level ($p \leq 0.05$) (14).

Results

Figure (1) showed there was a significant increase was found in glucose concentration ($p \leq 0.05$) in all treatments as compared with the control group (healthy one) whereas the results that showed a significant decreased in group of the Uranyl acetates & the aqueous extract of the Borage Officinalis as compared with the uranyl group only.

The results also showed there was a significant increased ($p \leq 0.05$) in the total cholesterol concentration of the whole treatment as compared with the control group (the healthy one) , whereas the results showed a significant decreasing in the group of the uranyl + aqueous extract of the Borage Officinalis as compared with uranyl group only , (figure 2).

Whereas , figure (3) showed a significant increase ($p \leq 0.05$) in the triglycerides concentration of the whole treatments as compared with the control group (the healthy one) , whereas the results showed a significant decreasing in the group of the uranyl + the aqueous extract of the

As well , figure (4) showed a significant decrease ($p \leq 0.05$) in the HDL – C in the blood serum of the albino male rabbits for the whole treatments as compared with the control group (the healthy one) , when the results referred to a significant increasing in group of the animals treated with the uranyl acetates + the of Borage Officinalis plant as compared with the group of the uranyl acetates only .

Furthermore , figure (5) there was a significant increase ($p \leq 0.05$) in the LDL – C in the albino male rabbits of the whole treatments as compared with the control group (the healthy one) , when the results showed a significant decreasing in the group of the treated animals by the uranyl acetates + plant of the Borage Officinalis as compared with the group of the uranyl acetates only .

Whereas figure (6) showed a significant increase ($p \leq 0.05$) in the VLDL – C in the albino male rabbits of the whole treatments as compared

with the control group (the healthy one) , when the results showed a significant decreasing in the group of the treated animals by the uranyl acetates + plant of the Borage Officinalis as compared with the group of the uranyl acetates only .

Moreover, figure (7) indicated there was a significant increase ($p \leq 0.05$) in the whole treatments as compared with the control group (the healthy one) , whereas the results showed a significant decreasing at the significant concentration in the animals group that treated with the uranyl acetates + plant of the Borage Officinalis compared with the uranyl acetates group only.

It is noted in the results illustrated in the figure (8) there was a significant decrease at the significant concentration ($p \leq 0.05$) in the GSH concentration of the albino male rabbits blood serum for the whole treatments as compared with the control group (the healthy one) , whereas the results are showed a significant increasing in the average of the GSH for the animal group treated with uranyl acetates + Borage Officinalis as compared with the uranyl acetates group only .

Discussion

The current study showed a significant increasing in the glucose concentration in the blood serum after the treatment with uranyl acetates as measured with the control group (the healthy one) ,It is possible that the cause is due to the adverse effect of the uranyl acetate on the pancreas tissue , in particular , the β-pancreas cells , so this effect is reflected on the average of the glucose concentration in blood and the capacity of the pancreatic cells in balancing insulin secretion and the moderation of the glucose concentration or it is may be the cause due to expose to fatigue by the treatment with uranyl acetates distinguished by the high toxicity that leads to stop the metabolic ways .

Whereas the group treated with the uranyl acetates & the aqueous extract showed a significant decreasing as compared with the animals group treated with the uranyl acetates only , the cause that may contribute to the lowering role in the blood glucose level is the impact of this extract in inhibiting the gut absorption of the glucose or decreasing the average the glucogenic activity (7) . As well as this aqueous extracts may lead to the peripheral using of sugar by the fat and muscular tissues directly or indirectly by the increasing the sensibility of the insulin with decreasing simultaneously in the glucogenic activity(8), In the healthy animals treated with the extract only are showed a significant increasing in the glucose of the blood at the beginning of the experiment as compared with the control group (the healthy one) .The reason is due to lack of the immense antidiabetic activity concerning, The impact of the uranyl acetates and the extract in the total cholesterol concentration .

the study showed a significant increasing in the total cholesterol concentration in the blood serum after the treatment with the uranyl acetates compared with the control group . The

cause may contribute to the negative effect to the uranyl acetates in the liver tissue in general , and in the bilious canal in particular , because the infection of the liver tissues reflected on the average of the fat metabolism (including the cholesterol) and then they charged their concentrations in blood serum(9) . The uranyl acetates are able to reduce the capacity of liver in reservation of the balancing by releasing chylomicron particles from the blood stream and then increasing the cholesterol level (9).

The results also showed there is a significant decreasing in the total cholesterol concentration in the blood serum of the animals treated by the extract with the uranyl acetates. The cause id due to the aqueous extract compositions as materials lowering the cholesterol , the hypothetical machination to the effect that lowered the cholesterol by the proteins of extract worked in these amino acids forming these proteins and certain specific peptides . All these considered as the helping and contributing factors in that impact , so they operate to modify and stop the defect occurring in the operation of metabolism in liver and bile cholesterol , because the liver is the central organizer of the releasing operation of the cholesterol across the bilious production and releasing(10) . The results added an important remarker being potential by the extract to inhibit the degenerative action of of the uranyl acetates to the liver cells and to maintain them and to reduce the abnormalities occurring in the fat metabolism , as well as the role of the components entering in the plant extract directly in activity of some enzymes that are responsible for the fat metabolism .

The particles of VLDL – C and chylomicron particles are very rich in triglycerides . These particles are transformed and degenerated by lipoprotein lipase(11) , so the inhibiting of these enzymes by uranyl acetates causes the increasing of triglycerides concentration in serum . This is indicated through the statistic analysis results as an significant increasing at concentration of the triglycerides when the treatment are performed with . In addition that the exposing the liver tissue to damage due to the treatment reduced its capacity of pulling the particles of fats including the triglycerides , and then occurring an increasing in its concentration into the serum(9). The group treated by extract with the uranyl acetates is showed a significant decreasing as compared with the uranyl group only , this is due to effect of the extract components in ApoB particles , because the liver plays a principles role in organizing the triglycerides in plasma through production and releasing and metabolizing the (ApoB)(12)particles.

This study showed a significant decreased in the serum HDL –C of the uranyl acetates group as compared with the control group (the healthy one) , the cause is due to effect of the uranyl acetates on the liver enzymes that analyzing the fats that act as analyzing the HDL – C particles , and

taking the cholesterol from it where it is in the liver cell to transform to the bilious esters , especially , the uranyl acetates have an impact inhibiting the liver metabolism(13) . The animals that treated with the uranyl acetates plus the aqueous extract of the Borage Officinalis plant showed an significant increased in HDL – C , the cause is due to the plant components reduced the abnormalities occurring in metabolism of fats and their construction in liver where the principle place of manufacturing the particles of (HDL – C)(9) is and then increasing their release in the blood stream , where these particles transported cholesterol from the tissues to the liver to secret it as bilious matter and it is also reducing the negative impact of the LDL – C particles by transporting it remotely from the arteries to the liver to release outside(11). To the results of the VLDL – C and LDL – C in blood serum , the recent study witnessed a significant increasing in the both concentrations as compared with the control group , the cause is due to inhibit the action of the analysing enzymes to lipoproteins owning to the expositing to the uranyl acetates such as lipoprotein lipase. However , the role of the aqueous extract in the group treated by the uranyl acetates , the cause is due to role of the extract components to maintain the cells and reducing the resulting damages through the treatment by the uranyl acetates in additional the direct reducing of the components in activity a certain of the enzymes that are responsible for the metabolism of the fats and then it is acting to reduce their levels to the other results that included MDA and GSH .

The study indicated to the increasing of MDA concentration and decreasing of GSH concentration in the group (the healthy one) .The cause is due to treating with the uranyl acetates that make several diseases activated by the by the oxidative stress because the free radicals activity increased more than the capacity of the antioxidants to release or modify them . This is lead to increase in peroxidant of fat and lift the level of MDA and lost of the balancing between the activity of the free radicals and the action of antioxidants that made the oxidative stress in order to the increasing of the MDA concentration acts to lose the flexibility of the cell membranes(11), The improvement that happened due to the decreasing MDA and increasing GSH in the groups treated with the extract with the uranyl acetates to this extract is reducing the peroxidating of fat resulting from the hydrogen peroxide . This is due to the activated components in this extract that contain the antioxidants such as enzymatic as catalyase and non – enzymatic like Vit. C which is maintaining the living cell membranes(9).

The present study conclude that there were a significant : serum glucose & MDA & also significant decrease in serum HDL – C , GSH.

The present study recommend the use of Borage Officinalis.

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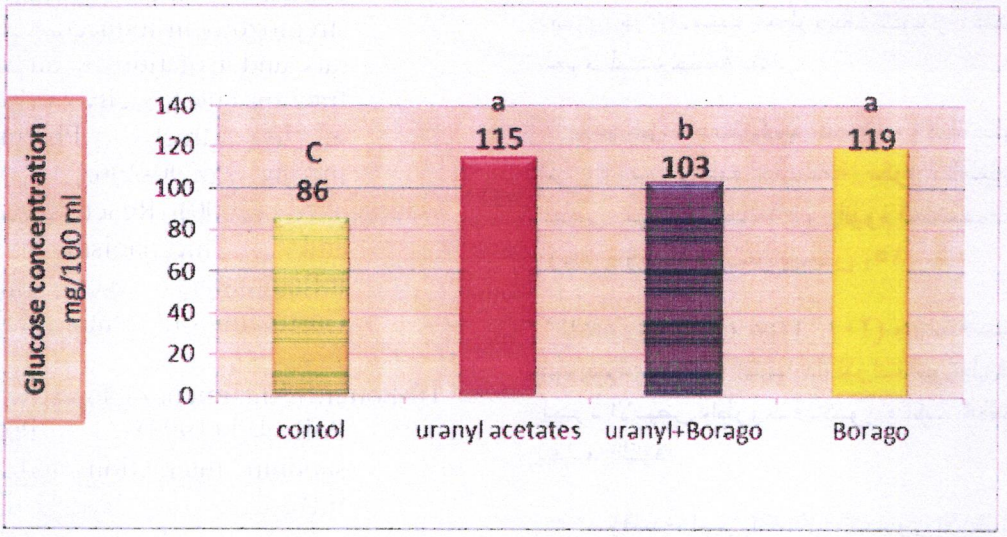
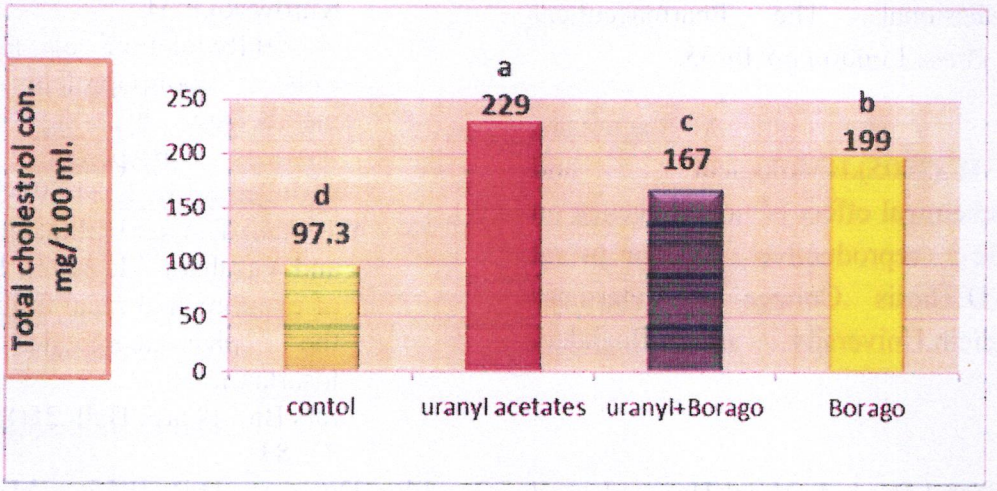


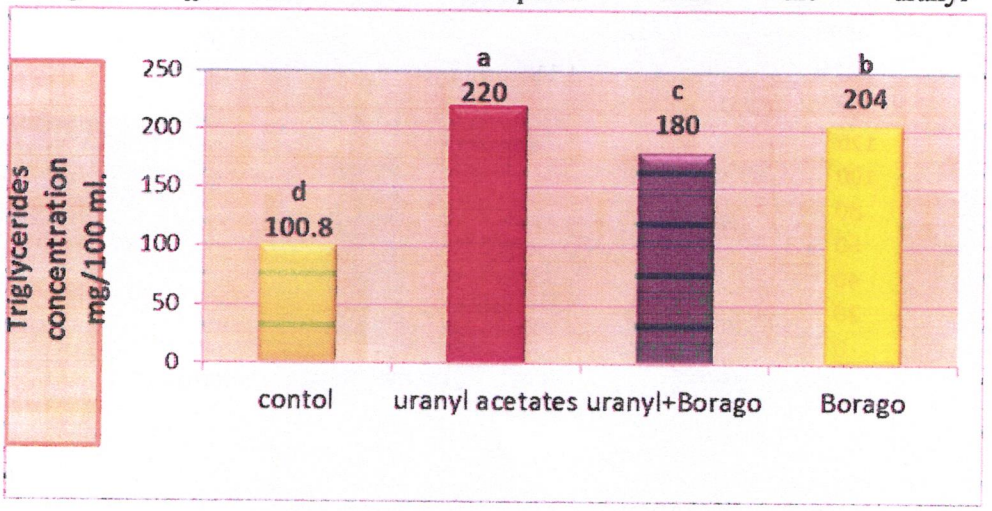
The figure (1) illustrated the effect of the uranyl acetates and the *Borage Officinalis* extract in the glucose concentration in the albino male rabbits blood serum.

* The different letters mean the significant differences at concentration ($p \leq 0.05$).

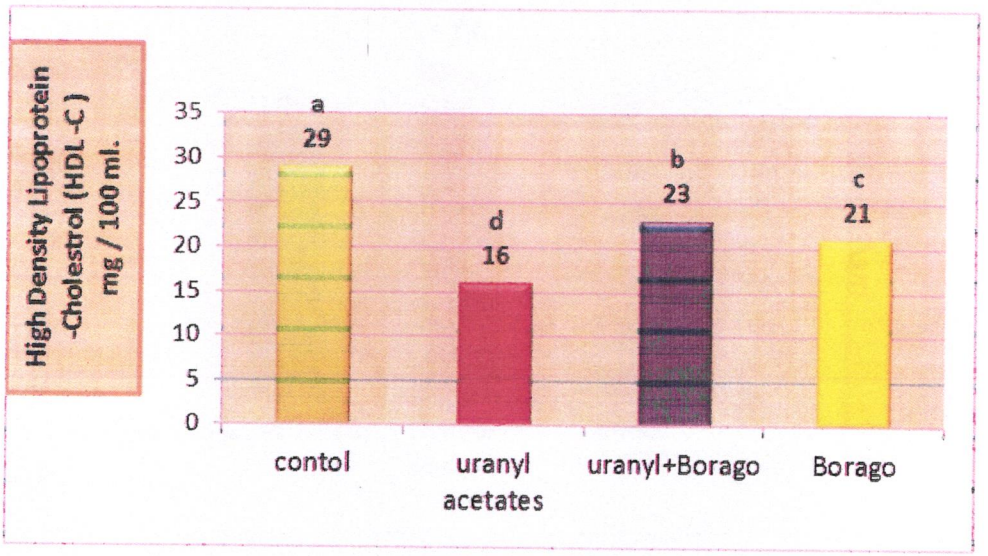


The figure (2) illustrated the effect of the uranyl acetates and the *Borage Officinalis* extract in the cholesterol concentration in the albino male rabbits blood serum.

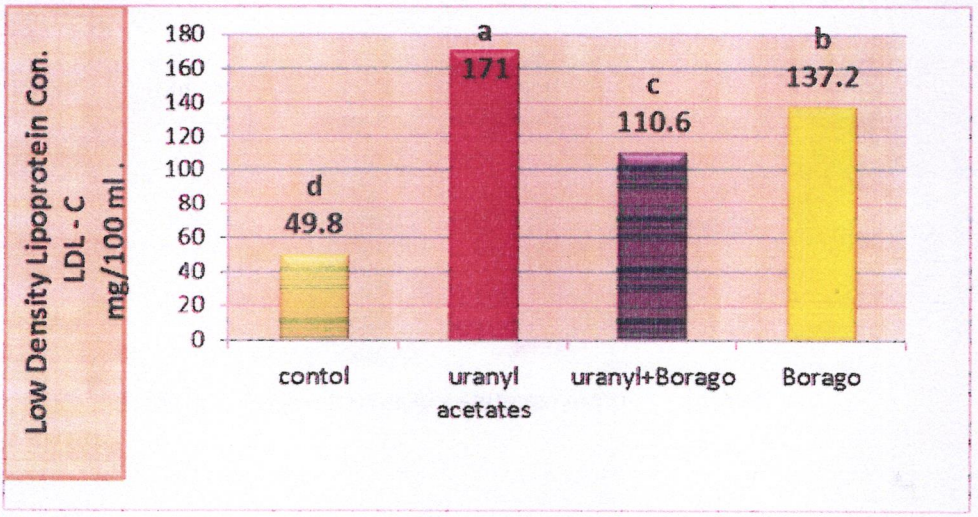
Borage *Officinalis* as compared with the uranyl group.



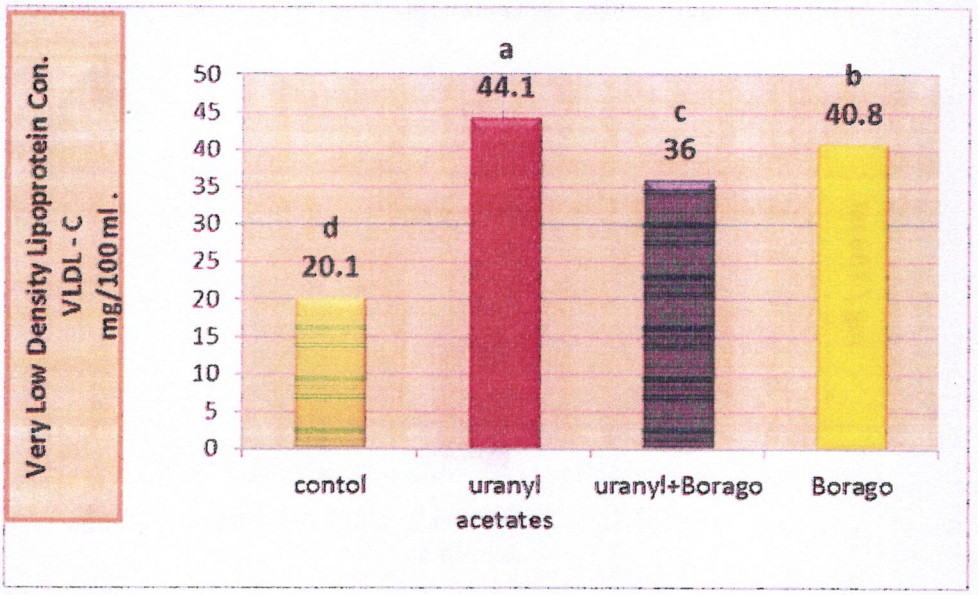
The figure (3) illustrated the effect of the uranyl acetates and the extract of *Borage Officinalis* plant in the triglycerides concentration in the albino male rabbits blood serum.



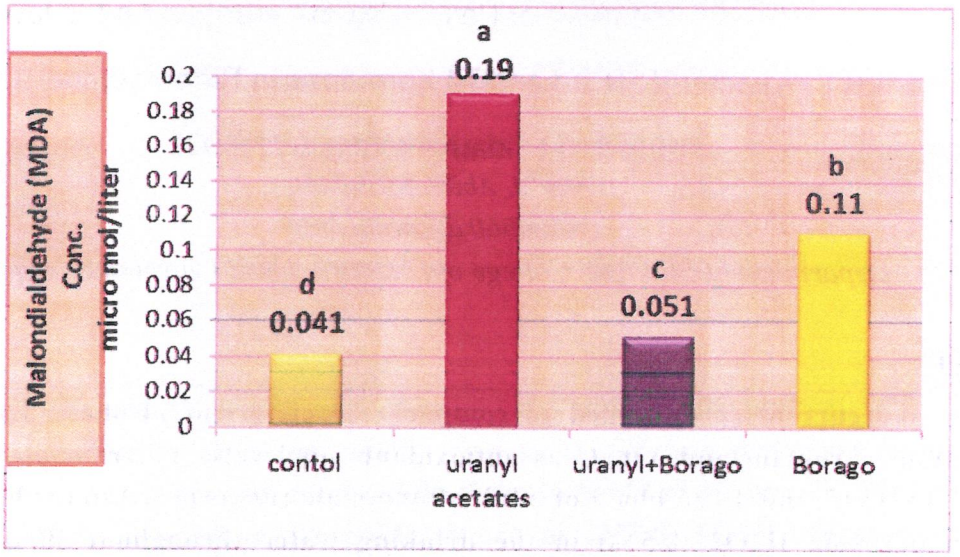
The figure (4) illustrated the effect of the uranyl acetates and the extract of the of *Borage Officinalis* plant in the HDL – C in the albino male rabbits serum .



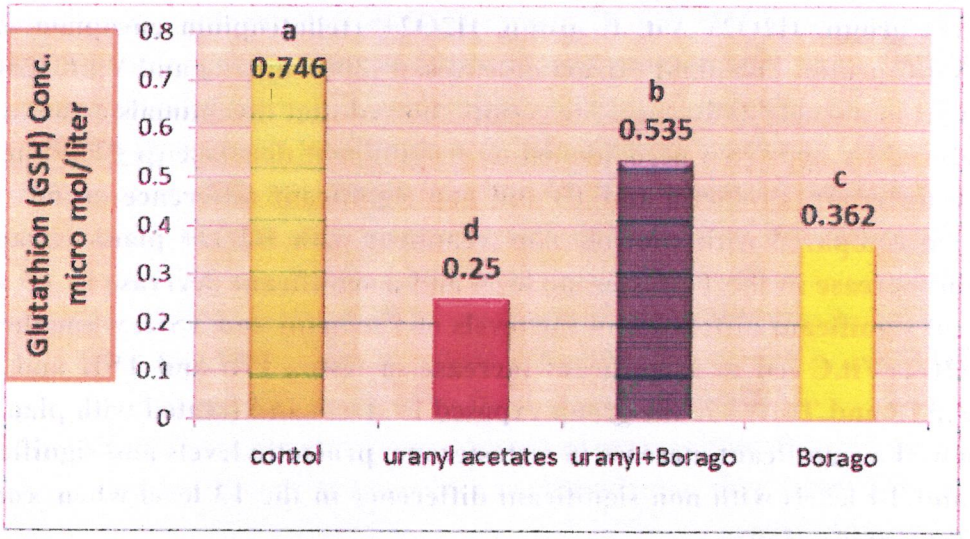
The figure (5) illustrated the effect of the uranyl acetates and the extract of the of *Borage Officinalis* plant in the LDL – C in the albino male rabbits serum .



The figure (6) illustrated the effect of the uranyl acetates and the extract of the of *Borage Officinalis* plant in the VLDL – C in the albino male rabbits serum .



The figure (7) illustrated the effect of the uranyl acetates and the extract of the *Borage Officinalis* plant in the MDA concentration in the albino male rabbits blood serum.



The figure (8) illustrated the effect of the uranyl acetates and the extract of the *Borage Officinalis* plant in the GSH concentration in the albino male rabbits blood serum.