مجلــة البحوث البيئية والطاقة
جـامعة المنوفية قطاع خدمة المجتمع وتـنمية البيئة

Rams (Haloxylon salicornicum) Powder and Extract in Diets of Male Albino Rats to Cope Hyperglycemia

Prepared by

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جامعة المنوفية– كلية الاقتصاد المنزلى
قسم تغذيه وعلوم الأطعمه –شبين الكوم –المنوفيه – مصر

المجلد ١١ العدد (١٩) يوليو ٢٠٢٢م

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Abstract:

This study aims to examine the effect of rams (*Haloxylon salicornicum*) and levels for treatment of diabetic rats, powdered *H. salicornicum* 5&7% and 5% extract were impaired. Twenty-five adult male albino rats, weighing 150-160g were divided into two main groups and three groups, each with five rats. **The first main group**: (the control negative group).**The second main** group: 20 rats were injected with alloxan to induce diabetes, and then divided as follows : Diabetic rats (non-treated, control positive), diabetic treated with a 5% rams herb powder, diabetic treated with a 7% rams herb powder and diabetic treated with oral rams herb alcohol extract of (3 ml / day\rat) .At the end of the experiment (4 weeks), the blood samples were collected after 12 hours of fasting and serum was separated for determination of: Serum glucose ,Lipid profile : Total Cholesterol, tri- glycerides **(TG),** high density lipoprotein **(HDL-C),** low density lipo protein **(LDL-C),** very low density lipo protein **(VLDL-C),** urea, creatinine, uric acid, alanine aminotransferase (ALT) **and** aspartate aminotransferase(AST). At the same time, the organs: Liver, heart, spleen, kidney and lungs were removed, washed in saline solution, wiped with filter paper and weighted. The obtained results revealed that, treatment by the best **result** was recorded for group 5 (hyperglycemic rats fed on rams extract 5%) which led to a significant decrease in body weight gain , feed intake , feed efficiency ratio, serum glucose, (TC), (TG), (LDL-C), (VLDL-C), a significant increase of (HDL-C) was observed , and Liver and kidney functions were also improved. In conclusion , the study

recommendad using rams herbs It contains flavonoids that regulate and lower blood glucose levels.

Keywords: *Haloxylon salicornicum*, Diabetes, Alloxan, Lipid profile, Liver and Kidney Functions.

Introduction

Diabetes mellitus (DM) is a metabolic disorder where the human body does not produce or properly use insulin, a hormone that is required to convert sugar, starches and other food into energy. Absence or reduced insulin in turn leads to persistent abnormally high blood sugar and glucose intolerance. It is probably the oldest disease known to man. It is also referred to as black-death from the 14th century (**Deepti *et al*., 2017).**

In people with diabetes, blood sugar levels remain high. This may be due to insulin is not being produced at all, is not made at sufficient levels, or is not as effective as it should be. The most common forms of diabetes are type 1diabetes (5%), which is an autoimmune disorder, and type 2 diabetes (95%), which is associated with obesity. Gestational diabetes is a form of diabetes that occurs during pregnancy, and other forms of diabetes are very rare and are caused by a single gene mutation **(Ozougwu *et al*., 2013)**

H. salicornicum plant was responded to be used in 12 diseases like inflammation (50.0%), veterinary medicines (35.7%), Diuretic (28.6%), diabetes (21.4%), insect bite (21.4%), skin diseases (21.4%), ulcer (21.4%), piles (21.4%), wounds (21.4%) and eye infections (21.4%) by the local medicinal plant experts. Flowers and leaves were the most commonly used plant parts but roots and sometimes whole plants (crushed) are used in some diseases. Only a few past studies reported its use as a medicinal plant (**Arshad and Akbar., 2002**).

The plant is reported to be used as anti-diabetic **(Ajabnoor *et al*., 1984**), antibacterial (**Al-Saeed., 2002)**, and anti-inflammatory **(Al-Shanawani, 2002).** Two species of the genus were recorded in the literature to have folkloric uses. *H. salicornicum* is reported to be used for antiseptic and anti-inflammatory ***(*Ajabnoor *et al*., 1984) and (Shaukat, 2000)** .Traditional healers are using it to treat intestinal ulcers **(Barakat et al., 1991)** In Oman the stems of this species are used as a mordant for dyeing wool in traditional weaving. In addition, *Haloxylon scoparium {Haloxylo articulatum}* is used to treat eye disorders **(Salah *et al*., 2002).** Infusion and powder infusion of the aerial part of *H. scoparium* are used in Morocco for their antidiabetic effects **(Bnouham *et al*., 2002) and (Eddouks *et al.*, 2002).** The qualitative phytochemical analysis of the aerial parts of the plant

revealed, the presence of alkaloids, cardiac glycosides, anthraquinones, flavonoids, saponins, coumarins, sterols, tannins, volatile oils and volatile bases **(Ajabnoor *et al*., 1984)**. On the other hand, few species of the genus Haloxylon (seven species) have been chemically investigated, which resulted in the isolation of the several alkaloids belonging to mainly seven classes of alkaloids. These classes are Aliphatic quaternary alkaloids, pyridine alkaloids, indole alkaloids, isoquinoline alkaloids, isoquinolone alkaloids, β-carboline alkaloids and phenyl ethylamine alkaloids **(Benkrief *et al*., 1990).** A piperidyl alkaloid "haloxynin" has also been isolated and characterized form *H. salicornicum* by mass spectrometry, among the 80 identified alkaloids. New flavonoids quercetin 3-O-β-glucosyl [1→2]-αrhaminoside-7-O-α–rhaminoside and quercetin3-O-pcoumaryl [1→6]-β-glucosyl [1→6]-β-glucoside-7-O-α rhaminoside, together with known compounds quercetin 3-gentiobioside, isoquercetin, quercitrin and kaempferol were isolated from the aerial part of *O. baccatus* **(Benkrief *et al*., 1990)**.

Consequently, this study examined the effects of Rams powder and extract on hyperglycemic rats

Materials and Methods

Intended Herb: Rams (*Haloxylon salicornicum*)

Chemicals: Alloxan **,** Ethyl alcohol and Formalin

Rats: male albino rats, weighing 150-160g. Obtained from twenty-five adult Research Institute of Ophthalmology, Medical Analysis Department, Sprague Dawley strain, Cairo, were used in this study. Rats were housed in wire cages under normal laboratory conditions, and were fed on conditions diet for a week as an adaptation period. Diet was offered to rats in special feed cups to avoid loss conditions of feed, water was provided to the rats by glass tubes supported to one side of the cage, feed and water were provided ad-libitum and checked daily.

Methods: induction of diabetic rats: Diabetic was induced in 25 normal rats by subcutaneous injection of alloxan (150 mg/kg body weight) according to the method described by **(Desai and Bhide,1985).** One week after the injection of alloxan, fasting blood samples were obtained by retro or betel

method for estimating fasting serum glucose. Rats having fasting serum glucose of more than 200 g/dl were considered diabetics **(NDDG,1994).**

Preparation of Alcoholic Extract: Ethyl alcohol extract was prepared using diethyl ether alcohol. Alcohol (solvent) was expelled by rotary evaporation.The remained powder was dissolved in distilled water and only 1 ml of extract equivalent to 5g of the herb was used for each rat orally **(Walaa,2012**).

Biological Experiments:

Basel diet composition of tested rats:

Table (A): The Composition of Basal Diet**(AIN,1993).**

Compounds	Amount
Protein	**10%**
Corn oil	**4%**
Mineral mixture	**3.5%**
Vitamin mixture	**1%**
Cellulose	**5%**
Choline chloride	**0.2%**
Methionine	**0.3%**
Corn starch	**Up to 100% (76%)**

Experimental Design:

The experiments were performed in the Faculty of Home Economics, Menoufia University, Shebin El-kom. Rats were housed in wire cages at room temperature of 25^{o} C, and kept under normal healthy conditions.

Rats Were Distributed as The Following Groups:

- **The first main group**: Control negative group (5 rats).
- **The second main** group: 20 rats were injected with Alloxan for induced diabetes, and then divide as follows :
- Diabetic rats the non-treated group (control positive).
- Diabetic rats with a 5% rams herb powder.
- Diabetic rats with a 7% rams herb powder.

- Diabetic rats with rams herb extract of 30 ml/day.

Biological evaluation:

During the experimental period **(28 days),** the diet consumed was recorded every day and body weight was recorded every week. The body weight gain **(BWG "g"),** feed efficiency ratio **(FER),** and organ/ body weight (g) were determined according to **(Chapman *et al.*, 1959) using** the following equations:

$$\textbf{BWG (g)} = \textbf{(Final weight - Initial weight)/28}$$

$$\textbf{FER} = \frac{\textbf{Grams gain in daily body weight}}{\textbf{Grams daily feed consumed}}$$

Blood Sampling, Weight of Internal Organs and serum analysis:

Blood samples were collected after 12 hours of fasting at the end of the experiment using the abdominal aorta in which the rats were sacrificed under ether anesthesia. Blood samples were received into clean dry centrifuge tubes, and left to clot at room temperature, then centrifuged for 10 minutes at 3000 rpm to separate the serum. Serum was carefully aspirated and transferred into clean tubes, stored frozen at -20℃ for analysis as described by **(Malhotra, 2003).** All serum samples were analyzed for to determine the following parameters: Serum glucose according to the method of (**(Young, 2001**), triglycerides according to (**Fassati and Prencipe,1982**), total cholesterol according to the method of (**Allain,1974)**, HDL according to the method **(Lopez,1977),** VLDL and LDL according to the method of (**Lee,1996)** , urea according to the method described by **(Patton and Croush ,1977)**, uric acid according to the method described by **(Schultz,1984),** creatinine according to the methods described by **(Henry,1974)**, GOT according to the method **(Yound,1975**)**,** GPT according to the method of **(Tietz,1976)**, Alkaline phosphatase (ALP) according to the method **(Belfied,1971).** At the same time, the organs: Heart, kidney, liver, lungs and spleen were removed, washed in saline solution, wiped by filter paper & weighted .

Results and Discussion:

a- Effects of Rams powder and its extract on BWG, FI, and FER in rats suffering from hyperglycemia

Table (1) illustrated the effect (*H. salicornicum*) powder 5%, 7% and extract 5% on body weight gain (BWG), feed intake (FI) & feed efficiency ratio (FER) of hyperglycemic rats. As shown in the table, the best results in BWG, FI and FER were recorded for the group (3); (hyperglycemic rats treated with rams powder 5%) followed by the group treated with 7% rams powder and rams extract 5%, respectively. This result agree with (**Singh *et al*., 2015**) they reported that rams reduced body weight.

Table (1): Effect of rams (*H.salicornicum*) on body weight gain (BWG), feed intake (FI) and feed efficiency ratio (FER) of hyperglycemic rats

Parameters / Groups	BWC (day/rat)	FI (g/day/rat)	FER
	Mean±SD		
G (1) Negative control	$1.75^{a} \pm 0.001$	$14.28^{a} \pm 0.009$	$0.122^{a} \pm 0.0005$
G (2) Positive control	$1.58^{e} \pm 0.008$	$14.03^{e} \pm 0.001$	$0.112^{d} \pm 0.0001$
G (3) Rams powder 5 %	$1.7^{b} \pm 0.005$	$14.24^{b} \pm 0.005$	$0.119^{b} \pm 0.0006$
G (4) Rams powder 7 %	$1.66^{c} \pm 0.006$	$14.21^{c} \pm 0.002$	$0.116^{c} \pm 0.0009$
G (5) Rams extract 5%	$1.6^{d} \pm 0.009$	$14.15^{d} \pm 0.008$	$0.113^{d} \pm 0.0007$
LSD (P≤ 0.05)	**0.011**	**0.011**	**0.001**

Means in the same column with different litters are significantly different at ($p < 0.05$)

b - Effects of Rams powder and its extract on internal organs weight in rats suffering from hyperglycemia

Table (2) results illustrate the effect of hyperglycemic rats fed on rams (*H. salicornicum*) powder 5%, 7% and extract 5% on weight of internal organs including liver, kidney, heart, spleen and lungs weights . As shown in this table, all treated groups showed a significant decrease in these organs' weights, as compared to the positive control group. the best **internal organs were** recorded for group 5 diabetic rats fed on Basal diet and treated with rams extract 5%, followed by diabetic group fed on diet containing 7% rams powder. This result in the same line (**Fatima *et al*.,2016**) they found that rams (*H. salicornicum*) significantly reduced weight of internal organs.

Table (2) : Effect of rams (*H. salicornicum*) on organs liver, kidney and heart, spleen and lungs weight (g) of hyperglycemic rats

Parameters / Groups	Liver weigh (g)	Kidney weight (g)	Heart weight (g)	Spleen weight (g)	Lunges weight (g)
	Mean±SD				
G (1) N control	$7.86^{e} \pm 0.01$	$1.59^{e} \pm 0.01$	$0.74^{d} \pm 0.01$	$0.91^{e} \pm 0.01$	$1.19^{e} \pm 0.01$
G (2) P control	$8.52^{a} \pm 0.01$	$1.73^{a} \pm 0.01$	$0.96^{a} \pm 0.01$	$0.97^{a} \pm 0.01$	$1.38^{a} \pm 0.01$
G (3) Rams powder 5%	$8.16^{b} \pm 0.01$	$1.69^{b} \pm 0.01$	$0.84^{b} \pm 0.01$	$0.95^{b} \pm 0.01$	$1.32^{b} \pm 0.01$
G (4) Rams powder 7%	$7.98^{c} \pm 0.01$	$1.66^{c} \pm 0.01$	$0.79^{c} \pm 0.01$	$0.93^{c} \pm 0.01$	$1.27^{c} \pm 0.01$
G (5) Rams extract 5%	$7.89^{d} \pm 0.01$	$1.62^{d} \pm 0.01$	$0.73^{d} \pm 0.01$	$0.92^{d} \pm 0.01$	$1.22^{d} \pm 0.01$
LSD (P≤ 0.05)	0.008	0.020	0.016	2.80	0.014

Means in the same column with different litters are significantly different at ($p < 0.05$)

c - Effects of Rams powder and its extract on lipid profile in rats suffering from hyperglycemia

Table (3) results show the effect of hyperglycemic rats fed on rams (*H. salicornicum*) powder 5%,7% and extract 5% on serum lipid profile including

total cholesterol TC, triglycerides TG, high density lipoprotein HDL, low density lipoprotein LDL and very low density lipoprotein VLDL.

. As shown in this table, Diabetic groups which were treated with rams powder (5% and 7%) or rams extract 5% showed significant improvement in all lipid profile parameters, the significantly best **lipid profile** was recorded for group 5 diabetic rats fed on (Diabetic groups which were treated with rams powder (5% and 7%) or rams extract 5% showed significant improvement in all lipid profile parameters, **(Saleh *et al.*,2012) and (Suresh and Pratibha ,2014)** found that using rams with other herbs lower lipid profile .

Table (3): Effect of rams (*H. salicornicum*) on Lipid profile

Parameters / Group	TC (mg/dl)	TG (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)
	Mean±SD				
G (1) N control	$110^{e} \pm 1$	$94^{c} \pm 1$	$40^{a} \pm 1$	$51.2^{e} \pm 0.9$	$18.8^{C} \pm 0.2$
G (2) P control	$130.3^{a} \pm 0.8$	$98.2^{a} \pm 0.9$	$35^{c} \pm 1$	$75.7^{a} \pm 1.15$	$19.6^{a} \pm 0.2$
G (3) Rams powder 5%	$125.4^{b} \pm 0.6$	$96.8^{b} \pm 0.2$	$36.7^{b} \pm 1.15$	$69.4^{b} \pm 1.2$	$19.3^{b} \pm 0.05$
G (4) Rams powder 7%	$122.6^{c} \pm 1.15$	$94.5^{c} \pm 1.2$	$39.5^{a} \pm 1.2$	$64.2^{c} \pm 0.9$	$18.9^{c} \pm 0.25$
G (5) Rams extract 5%	$120^{d} \pm 1$	$92.7^{d} \pm 1$	$38.9^{a} \pm 0.1$	$62.6^{d} \pm 0.8$	$18.5^{d} \pm 0.2$
LSD (P≤ 0.05)	**0.40**	**0.72**	**1.60**	**0.32**	**0.147**

Means in the same column with different litters are significantly different at ($p < 0.05$)

d- Effects of Rams powder and its extract on serum glucose in rats suffering from hyperglycemia

Results in Table (4) show the effect of hyperglycemic rats fed on rams (*H. salicornicum*) powder 5%7% and extract 5% on serum glucose Diabetic rats which treated with rams (powder or extract) showed significant decrease in serum glucose, on the other hand serum glucose decreased gradually with increasing the level of rams powder . As shown in the table, the best glucose was recorded for group 5 diabetic rats fed on Basal diet and treated with rams extract 5%. This result agree with **(Ajabnoor *et al*.,1984), (Shabana et al., 1990)** and **(Jamal, 2018)** they found that rams (*H. salicornicum*) significantly reduced blood glucose in diabetic rats and the results indicated

that alcoholic extract and alkaloids extracted from (*H. salicornicum*) showed a significant decrease in glucose concentration. levels. Alkaloids isolated from (*H. salicornicum)* showed very high activity to decrease blood glucose levels in hyperglycemic rabbits, with significantly decreased (P<0.05).

Table (4): Effect of rams (*H. salicornicum*) on glucose (g) of hyperglycemic rats

Parameter / Groups	Glucose (mg/dl)
	Mean±SD
G (1) Negative control	$71.2^{e} \pm 0.9$
G (2) Positive control	$330^{a} \pm 1$
G (3) Rams powder 5%	$298.4^{b} \pm 1.2$
G (4) Rams powder 7%	$277.7^{c} \pm 1.15$
G (5) Rams extract 5%	$274^{d} \pm 1$
LSD (P≤ 0.05)	0.231

Means in the same column with different litters are significantly different at (p < 0.05)

e - Effects of Rams powder and its extract on liver enzymes in rats suffering from hyperglycemia

Table (5) illustrated the effect of hyperglycemic rats fed on rams (*H. salicornicum*) powder 5%, 7% and extract 5% on liver enzymes activities. As shown in this table, the significantly best **(AST) and (ALT)** mostly recorded for group 5 diabetic rats fed on basal diet and treated with rams extract 5%, this treatment showed significant decrease in AST & ALT enzymes, as compared to other treated groups. This result is in the same line with **(Ahmad and Erum, 2011),** they found that rams (*H. salicornicum*) significantly reduced AST and ALT. This reduction in serum enzymes level by HS is attributed to a decrease in the lipid peroxidation induced by the metabolites (CCl3•) and (CCl3 OO•).

Table (5): Effect of rams (*H. salicornicum*) on liver function of hyperglycemic rats

Parameters / Groups	AST (U/L)	ALT (U/L)
	Mean±SD	
G (1) Negative control	56.2^{e} ± 0.9	27^{d} ± 1
G (2) Positive control	64^{a} ± 1	37^{a} ± 1
G (3) Rams powder 5%	62^{b} ± 1	35^{b} ± 1
G (4) Rams powder 7%	60^{c} ± 1	35^{b} ± 1
G (5) Rams extract 5%	58^{d} ± 1	33^{c} ± 1
LSD (P≤ 0.05)	0.084	1.819

Means in the same column with different litters are significantly different at (p < 0.05)

f- Effects of Rams powder and its extract on kidney functions in rats suffering from hyperglycemia

Results in Table (6) illustrated the effect of hyperglycemic rats fed on rams (*H. salicornicum*) powder 5%,7% and extract 5% on kidney function activities, As shown in this table ,The mean value of serum uric acid and urea nitrogen decreased significantly p≤ 0.05 in hyperglycemic groups treated with rams powder or rams extract, as compared to the positive control group. On the other hand, the best serum level of **urea, uric acid and creatinine** recorded for group 5 diabetic rats fed on basal diet and treated with rams extract 5%, this treatment showed significant decrease in these parameters, as compared to other treated groups. In a study by **(Fatima *et al*., 2016**) reported that the liver and kidney tissues were damaged by the aluminum, and this damage decreased by using (H. salicornicum)

Table (6): Effect of rams (*H. salicornicum*) on Kidney function (creatinine, urea and uric acid) for hyperglycemic rats:

Parameters / Groups	UA (mg/dl)	Urea (mg/dl)	Creatinine (mg/dl)
	Mean±SD		
G (1) Negative control	$1.9^{e} \pm 0.1$	$17^{d} \pm 1$	$0.2^{e} \pm 0.1$
G (2) Positive control	$3.6^{a} \pm 0.1$	$27^{a} \pm 1$	$0.6^{a} \pm 0.1$
G (3) Rams powder 5%	$3.2^{b} \pm 0.1$	$25^{b} \pm 1$	$0.5^{b} \pm 0.1$
G (4) Rams powder 7%	$2.7^{c} \pm 0.1$	$24^{b} \pm 1$	$0.4^{c} \pm 0.1$
G (5) Rams extract 5%	$2.2^{d} \pm 0.1$	$22^{c} \pm 1$	$0.3^{d} \pm 0.1$
LSD (P≤ 0.05)	**0.19**	1.819	0.145

Mean in the same column with different litters are significantly different at (p < 0.05)

Liver

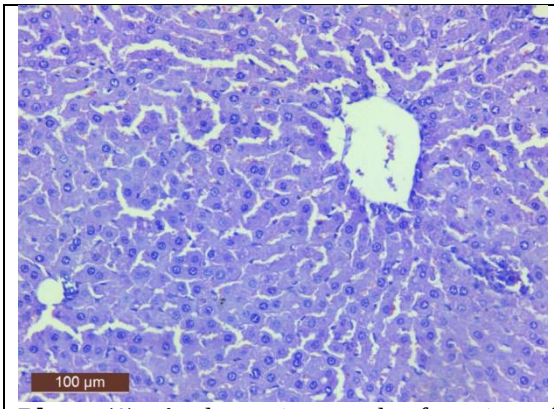

Photo (1): A photomicrograph of section of the liver of a control rat shows the normal architecture of the hepatic lobule. The central vein (CV) lies at the center of the lobule surrounded by cords of hepatocytes (HC) **(H & E. stain, Scale bar: 100 µm).**

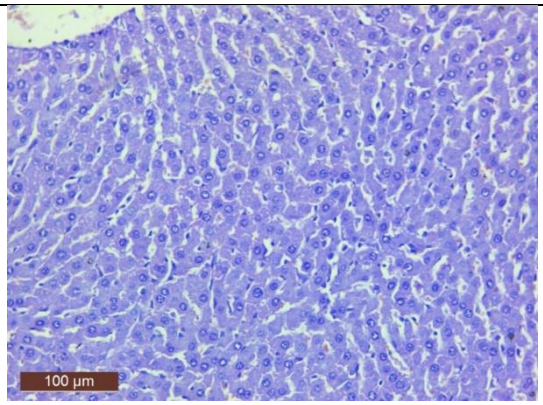

Photo (2): A photomicrograph of section of the liver of a positive control show the hepatic lobule appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

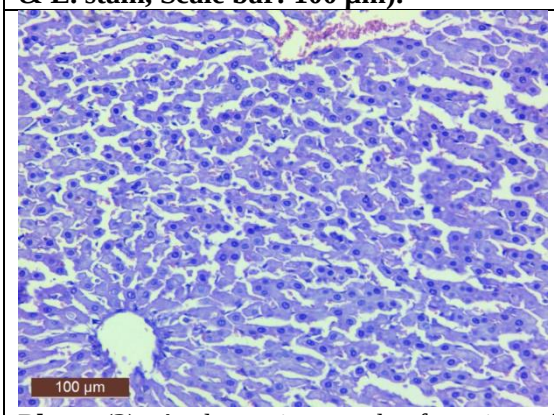

Photo (3): A photomicrograph of section of the liver of a diabetic rat treated with 5 % of haloxylon herb show the hepatic lobule appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

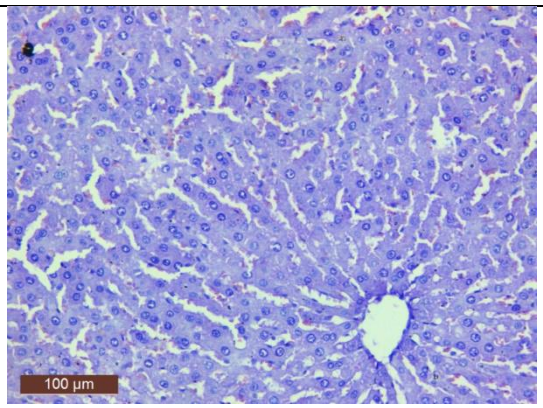

Photo (4): A photomicrograph of section of the liver of a diabetic rat treated with 7% of haloxylon herb show the hepatic lobule appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

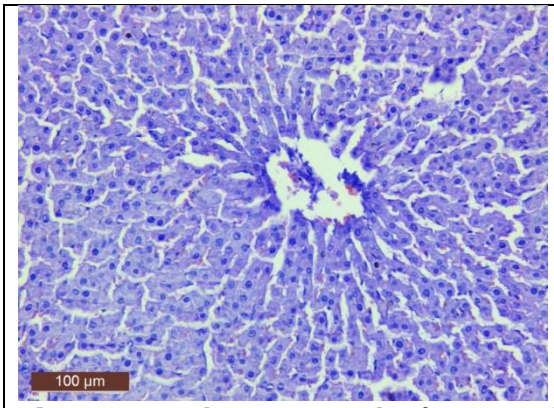

Photo (5): A photomicrograph of section of the liver of a diabetic rat treated with of haloxylon extract 5% show the hepatic lobule appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

Kidney

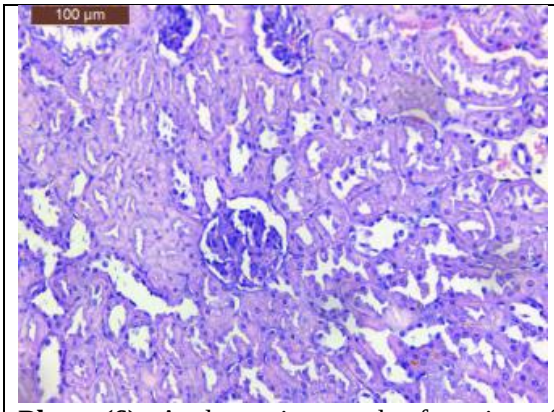

Photo (6): A photomicrograph of section of the kidney of a control rat shows the normal architecture of the renal corpuscles and tubules **(H & E. stain, Scale bar: 100 µm).**

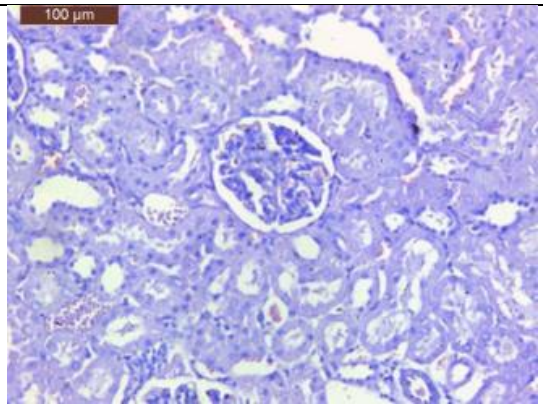

Photo (7): A photomicrograph of section of the kidney of group 2 rat shows interstitial dilatation associated with some cellular debris. Hemorrhagic areas and aggregation of lymphocyte infiltration were encountered in the tissues of the cortex **(H & E. stain, Scale bar: 100 µm).**

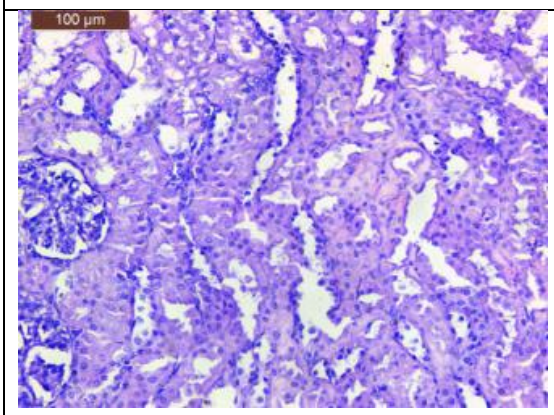

Photo (8): A photomicrograph of section of the kidney from rat of group 3 shows the renal corpuscles and tubules appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

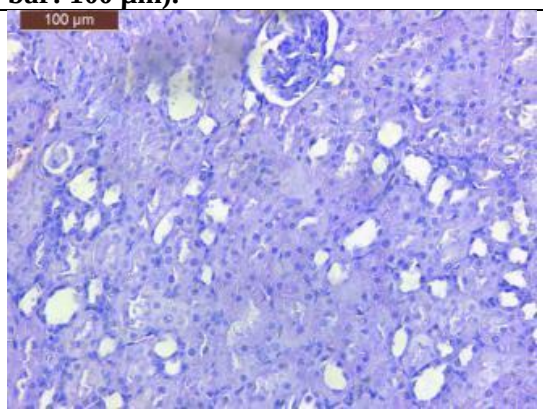

Photo (9): A photomicrograph of section of the kidney from rat of group 4 shows the renal corpuscles and tubules appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

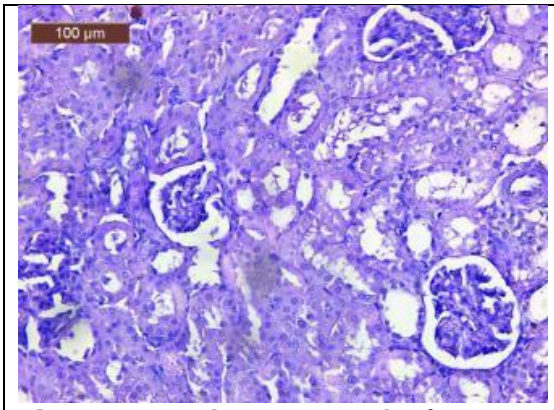

Photo (10): A photomicrograph of section of the kidney from rat of group 5 shows the renal corpuscles and tubules appeared nearly to the normal structure **(H & E. stain, Scale bar: 100 µm)**.

Heart

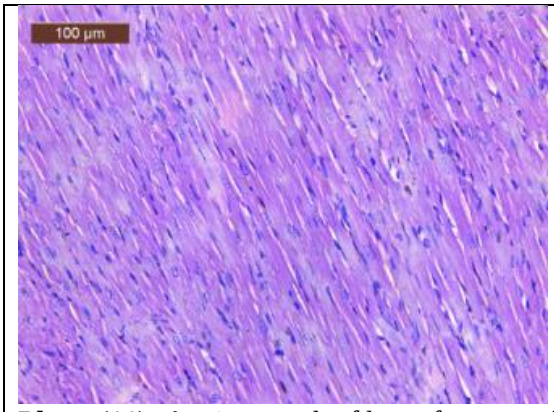

Photo (11): A micrograph of heart from rat of normal control group shows the normal histological architecture of cardiac muscles. Notice distinct, oval and centrally situated nuclei of with regularly arranged cardiac myofibres (H & E, Scale Bar: 100 µm).

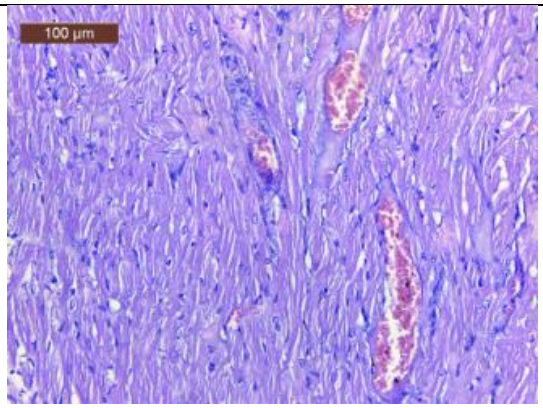

Photo (12): A micrograph of heart from rat of group 2 show deformation in sizes and shapes of cardiac muscles. The cardiac myofibres was established to be in disarrayed **outline**. Variety of degree of focal damages, dilatation of blood capillaries, and disturbance in the trabeculae of heart were found (H & E, Scale Bar: 100 µm).

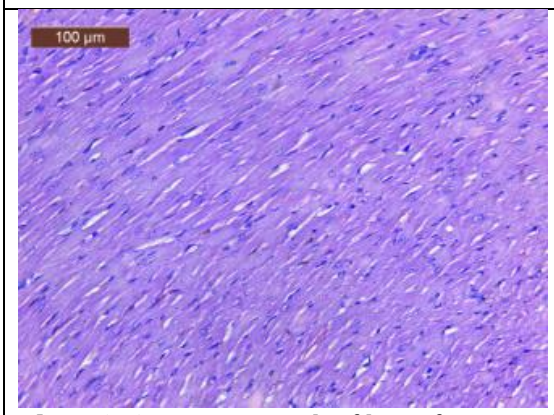

Photo (13): A micrograph of heart from rat of group 3 shows that the histological architecture of cardiac muscles appeared more or **less** like normal (H & E, Scale Bar: 100 µm).

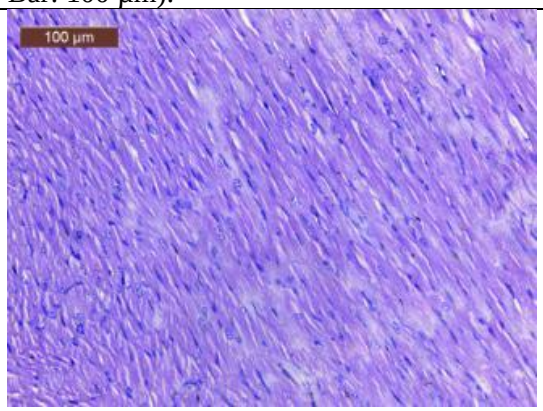

Photo (14): A micrograph of heart from rat of group 4 shows focal necrosis of some cardiac muscles. Other cardiac muscles appeared nearly normal structure (H & E, Scale Bar: 100 µm).

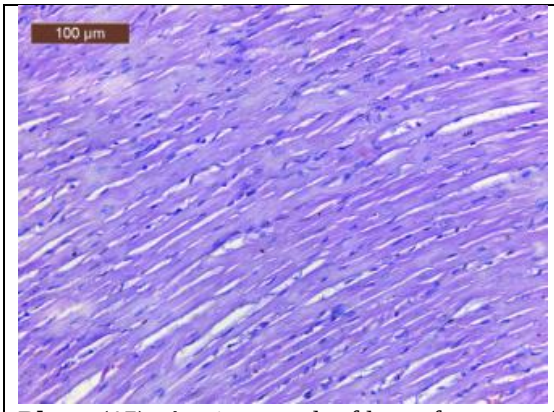

Photo (15): A micrograph of heart from rat of group 5 shows cardiac muscles appeared nearly normal structure. Focal necrosis of **cardiac** muscles was noticed (H & E, Scale Bar: 100 µm).

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الهدف الرئيسي لهذه الدراسة معرفة التأثيرات العلاجية **لاعشاب رمث بوضعها فى وجبات فئران الالبينو لمكافحه السكرى** تم استخدام خمس وعشرون من ذكور الفئران البيضاء من فصيلة (سبراجو دولي) تم تقسيمهم إلى مجموعتين رئيسيتين. المجموعة الرئيسية الاولي تم تغذيتها علي الغذاء الاساسي واستخدمت كمجموعة ضابطة (سالبة)، في حين تم اصابه المجموعه الثانيه الرئيسيه بالالوكسان . تم تقسيم المجموعة الرئيسية الثانية الي اربع مجموعات كل مجموعه تحتوى على خمس فئران المجموعه الاولى ضابطه موجبه ولم يتم معالجتها , المجموعه الثانيه تم معالجتها بعشبه رمث بتركيز ٥٪ , والمجموعه الثالثه تم معالجتها بعشبه رمث بتركيز ٧ % والمجموعه الاخيره تم معالجتها بمستخلص من عشبه رمث المجهز فى مستخلص كحولى(٣مل/يوم/للفأر) . في نهاية فترة التجربة (٤ اسابيع)تم تصويم الفئران طوال الليل قبل الذبح، تم تجميع الدم من كل فأرعلي حده وطرده مركزيا للحصول علي السيرم،تم فصل الكبد والكلي والقلب والطحال والرئه من كل فار ووزنهم وقد حسب التغيير فى وزن الاعضاء . اشارت النتائج المتحصل عليها الي ان معالجه فئران التجارب على مستخلص رمث بتركيز ٥ % ادي الي حدوث انخفاض معنوى فى (في الوزن المكتسب الجسم ، وزن الاعضاء ، جلوكوز ، و الكولسترول، و الدهون الثلاثية ، LDL–C، VLDL –C، وظائف الكلى (حمض اليوريك ، اليوريا، الكرياتينين)، و انزيمات الكبد ALT, AST وايضا زياده كولستيرول الليبوبروتينات عالية الكثافة .

الكلمات المفتاحية :عشبه رمث – السكرى – الالوكسان– سكر الدم – وظائف الكلى – وظائف الكبد – مشتقات الدهون .