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Anti DiabeticAnd HepatoprotectiveEffect Of Cloves (SyzygiumAromaticum Linn) On Rats Induced By Aloxan

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Abstract:

This study was conduced to investigate the effect of Syzygiumaromaticumon Diabetic Rats. Thirty six mature albino rats weighting 150-160g each were used, and divided into 6 equal groups, one was kept as a control-ve group, while the other groups were made diabetes by Aloxan (150 mg/kg). The tested plant was given as a percent of 3, 5, 7, and10% from the Basel diet for four weeks. After the treatment, blood samples were taken and serum glucose, triglyceride, total cholesterol, LDL-C, GOT, GPT, and ALP levels were measured, while HDL-C and VLDL- C were calculated. The results indicated that rats treated with Aloxan recorded significantly increasing in serum glucose, total cholesterol, LDL-C, VLDL-C and triglyceride levels ($p<0.005$) while HDL-C level was decreased ($p<0.005$) as compared to the control group. Treatment of diabetic rats with ***Syzygiumaromaticum*** caused a decrease in serum glucose, total cholesterol, LDL-C, VLDL-C, triglyceride levels, AST, ALT and ALP ($p<0.005$) with an increase in HDL-C level ($p<0.005$) when compared with the control group. It could be concluded that ***Syzygiumaromaticum*** were effective in protecting against diabetic rats not only decreased the level of serum glucose but also has beneficial effect on serum lipids and liver function. Therefore, we recommended this tested plant by a moderate amount to be included in our daily drinks.

Key words: Diabetic rats,*Syzygiumaromaticum*, serum lipids, Liver functions

1. Introduction

Diabetes mellitus is a systemic metabolic disease characterized by hyperglycemia, hyper lipedemia, hyper aminoacidemia, and hypo insulinaemia it leads to decrease in both insulin secretion and insulin action **(Maiti*et al*.,2004) and (Wadkar*et al*., 2008).**

There are three main types of diabetes, namely type I diabetes, type II diabetes and gestational diabetes. In type I diabetes, the β cells of the pancreas do not make sufficient insulin. Type II diabetes is the major form of diabetes, accounting for approximately 90–95% of all diabetic cases. This form of diabetes usually begins with insulin insensitivity, a condition in which muscle, liver and fat cells do not respond to insulin properly. The pancreas eventually loses the ability to produce and secrete enough insulin in response to food intake. Gestational diabetes is caused by hormonal changes during pregnancy or by insulin insufficiency. Glucose in the blood fails to enter cells, thereby increasing the glucose level in the blood. damage nerves and blood vessels, leading to complications such as heart disease, stroke, kidney dysfunction, blindness, nerve problems, gum infections and amputation(ADA,2014).
Kempf*et al.*, (2008) reported that Insulin injections, glucose-lowering drugs and lifestyle changes, such as exercise, weight control and diet therapy, are recommended for treating diabetes.

Plant foods rich in polyphenolic fractions have been reported to cause insulin-like effects in glucose utilization (**Gruenwald*et al*., 2010).**

Cloves (Syzygiumaromaticum Linn.) belonging to the family of Myrtaceae. It used as flavouring agent and also used as a spice for scenting and chewing tobacco. They are aromatic, stimulant and carminative, used for dyspepsia and gastric irritation **(Ambasta,1986).**

Clove is an aromatic flower bud, it used commonly in Africa and Asia in preparation of various spicy rich dishes. It has deep brown colour, intense fragrance and burning taste. In addition to its culinary uses, the clove bud and its oil have an abundance of medicinal and recreational uses. It had anti-diabetic, antioxidant, anti-inflammatory, anti-fungal, anti-viral, anti-microbial, antithrombotic, anesthetic, pain reliving and insect repellent properties **(Parle and Khanna, 2011).**

Also, Cloves used to keep good digestion and prevent vomiting in pregnancy also, it had an inhibitory effect on histamine production (Chaieb*et al*., 2007).

Shukri*et al*., (2010) reported that clove treatment significantly reduced blood sugar increases and lipid peroxidation in streptozotocin-induced diabetic rats by restoring the levels of antioxidant enzymes.

Cloves contain a potentially bioactive compounds such as sesquiterpenes, tannins and triterpenoids. The main aroma constituent of clove buds, eugenol (4-allyl-2-methoxyphenol), was reported to have antifungal activity **(Miyazawa and Hisama, 2003).**

Gulcin*et al*.,(2004) and Gulcin*et al*.,(2012) found that eugenol was classified by the United States Food and Drug Administration (FDA) to be a substance that is generally regarded as safe. The high levels of eugenol found in clove essential oil give it strong biological and antimicrobial activities. Eugenol was reported to have antifungal activity and inhibited malonaldehyde formation from cod liver oil and the formation of hexanol .

Clove oil has been listed as a "Generally Regarded as Safe" substance by the FDA when administered at levels not exceeding 1500 ppm in food categories. In addition, the World Health Organization (WHO) Expert Committee on Food Additives has established the acceptable daily human intake of clove oil at 2.5 mg/kg body weight for humans **(Kildeaa*et al.*, 2004).**

2. Materials and Methods

2.1 Materials:

Plants: ***Syzygiumaromaticum*** were obtained fromagricultural Seed, Spices and Medicinal Plants Co. (Harras), Cairo, Egypt.

Rats: thirty six male albino rats, weighing 150-160g per each were obtained from Medical Insects Research Institute, Dokki, Cairo.

Chemicals: All chemicals, solvents and buffers in analytical grade, Aloxan , vitamin and salt mixtures components used for rats feeding were purchased from Elgomhoria Company for Chemicals and Drug Trading, Cairo, Egypt. Casein was obtained from Morgan Chemical Co., Cairo, Egypt.

2.2 Biological experiments:

2.2.1 Basal diet:

The basic diet prepared according to the following formula as mentioned by **(AIN, 1993)** as follow: protein (10%), corn oil (10%), vitamin mixture (1%), mineral mixture (4%), choline chloride(0.2%), methionine (0.3%), cellulose (5%), and the remained is corn starch

(69.5%). The used vitamin mixture component was that recommended by (**Campbell, 1963**) while the salt mixture used was formulated according to (**Hegsted, 1941).**

2.2.2 Preparation of diabetic rats:

Normal healthy male albino rats was injected by intra- peritoneal injection of alloxan 150 mg\kg of body weight , according to the method described by **(Desai and Bhide 1985).**

One week after the injection of alloxan, fasting blood sample were obtained to estimate fasting serum glucose 200 mg\dl rats which was considered diabetes, **(NDDG, 1994).**

2.2.3 Experimental design

All biological experiments were done at the biology lab, Nutrition and Food Science Dept., Faculty of Home Economics, Minoufiya University, Shebin El-Kom, Egypt. Rats (n=36 rats) were housed individually in wire cages in a room maintained at 25 ± 2 ^{0}C and kept under normal healthy conditions. All rats (36 rats) were fed on basal diet for one-week before starting the experiment for acclimatization. After one week period, the rats were divided into two main groups, the first group (Group 6 rats) still fed on basal diet and the other main group (30 rats) was injected by 150 mg\kg of body weight of aloxan to induce diabetic rats then classified into five sub groups as follow:

- Sub group (2): fed on standard diet only as a positive control
- Sub group (3): fed on standard diet containing 3% ***Syzygiumaromaticum***
- Sub group (4): fed on standard diet containing 5% ***Syzygiumaromaticum***
- Sub group (5): fed on standard diet containing 7% ***Syzygiumaromaticum***
- Sub group (6): fed on standard diet containing 10% ***Syzygiumaromaticum***

- **2.2.4 Blood sampling:**

At the end of experiment period, 28 days, blood samples were collected after 12 hours fasting using the abdominal aorta and rats were scarified under ether anesthetized. 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 according to **Drury and Wallington, (1980).** Serum was carefully aspirate, transferred into clean covet tubes and stored frozen at -20^{o}C untill analysis

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2.2.5 Hematological analysis

Different tested parameters in serum were determination using specific methods as follow: serum glucose according to ***(Trinder, 1969)*** Lipid profile Cholesterol according to (***Allain, 1974)*** , tri glycerides **(T.G)** according to (***Fassati and Prencipe 1982) ,*** high density lipo protein **(H.D.L-C)** according to ***(Lopez, 1977).,*** low density lipo protein **(L.D.L-C)** according to ***(Lee and Nieman, 1996),*** very low density lipo protein **(V.L.D.L-C)** according to ***(Lee and Nieman, 1996)***alanine aminotransferase (**ALT**) according to **(Yound, 1975),** aspartate aminotransferase (**AST**) according to **(Tietz, 1976) and (Yound, 1975)**, alkaline phsphatase (**ALP**), according to **(Belfield and Goldberg, 1971).**

2.3. Statistical analyses

The data were statistically analyzed using a computerized costat program by one way ANOVA. The results are presented as mean ± SD. Differences between treatments at **($p \leq 0.05$)** were considered significant.

3. Results and Discussion

3.1 Serum Glucose (mg\dl) of diabetic rats and consumed Syzygiumaromaticum

Table (1) illustrate the mean value of serum Glucose of diabetic rats fed on *Syzygiumaromaticum.* It could be noticed that glucose of control (-) group was lower than control (+) group by the ratio of - 39.14 %. Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum glucose compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were – 33.66, - 38, - 39.51, and – 40.72 % for*Syzygiumaromaticum*by 3, 5, 7, and 10%, respectively. Non significant differences were observed amongst rats fed on 5, 7, and 10 % compared with control (-). Considering serum glucose, *Syzygiumaromaticum.*10 % group recorded the best treatment was observed for when compared to control (-) group.

Shukri et al., (2010) reported thattreatment by clove significantly reduced blood sugar increases in streptozotocin-induced diabetic rats by restoring the levels of antioxidant enzymes.

This results in agreement with (**Nada, 2011**) she reported that serum glucose noticeable improvement in rats induced by irradiation

after feeding on Clove oil extracts. It could be concluded that clove oil exerts a beneficial protective role against gamma irradiation.

Mani *et al*.,(2012) reported that administration of clove tea before or after ethanol administration led to significantly lower in serum glucose in rats, so they suggested that prolonged ethanol intake should be avoided when clove tea is consumed daily.

Also, this result in the same findings with (**Blessing *et al.*, 2012**) they found that acute maslinic acid (MA) derived from*Syzygiumaromaticum* administration induced dose-dependent reduction in blood glucose concentration in diabetic rats induced by streptozotocin.

Khathi*et al*., (2013) showed that there were not only down-regulated the increase of α-amylase and α-glucosidase and glucose transporters SGLT1 and GLUT2 in the small intestine isolated from diabetic rats treated with oleanolic acid (OA) and maslinic acid (MA) for 5 weeks. of STZ-induced diabetic rats, but also inhibited small intestine α-amylase, sucrase and α-glucosidase activity.

Adefegha*et al*., (2014) found that supplementation with clove bud powder (CBP) reduced blood glucose level in streptozotocin induced diabetic rat compared to control diabetic rats without CBP supplementation (DBC).

Table (1). Serum Glucose (mg\dl) of diabetic rats and consumed Syzygiumaromaticum

Variables	*(1)* negative control	(2) positive control	*Syzygiumaromaticum* (3) 3%	(4) 5%	(5) 7%	(6) 10%	*sig.*	*L.S.D* ($p \leq 0.05$)
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD		
Glucose (mg/dl)	69.33 ^{c} ± 5.1	136.66 ^{a} ± 4.7	90.66 ^{b} ± 4.04	84.66 ^{bc} ± 5.5	82.66^{bc} ± 9.3	81 ^{bc} ± 8.9	*	11.73
%change of positive control	- 49.14	—	- 33.66	- 38	- 39.51	- 40.72	—	—

Means in the same row with different litters are significantly different, * Significant ($p \leq 0.05$)

3.2 Serum total cholesterol and triglycerides (mg\dl)of diabetic rats and consumed Syzygiumaromaticum

Table (2) illustrate the mean value of serum total cholesterol and triglycerides (mg\dl) of diabetic rats fed on *Syzygiumaromaticum*.. It could be noticed that (T.C) of control (-) group was lower than control

(+) group by the ratio of -37.74 %. Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum T.C compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were – 7.16, - 21.48, - 28, and – 31.13 % for*Syzygiumaromaticum*by 3, 5, 7, and 10%, respectively. Non significant differences were observed amongst rats fed on 7 ad 10 % of *Syzygiumaromaticum*. Considering serum T.C, *Syzygiumaromaticum.*10 % group recorded the best treatment was observed for when compared to control (-) group. Considering serum (T.G). It could be noticed that (T.G) of control (-) group was lower than control (+) group by the ratio of -31.62 %. Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum T.G compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were – 6.5, - 12.5, - 20.9, and – 22.7 % for*Syzygiumaromaticum*by 3, 5, 7, and 10%, respectively. Non significant differences were observed amongst rats fed on 7 ad 10 % of *Syzygiumaromaticum*. Considering serum T.G, *Syzygiumaromaticum.*10 % group recorded the best treatment was observed for when compared to control (-) group.

Shukri et al., (2010)reported thattreatment by clove significantly reduced lipid peroxidation in streptozotocin-induced rats by restoring the levels of antioxidant enzymes

Ramadan et al., (2013) demonstrated that cloves contained significant levels of natural antioxidants. Tocols and phenolics at the levels estimated may be of nutritional importance as natural antioxidants and might directly react with free radicals and prevent lipid peroxidation. Cloves could be nutritionally considered as a non-conventional supply for pharmaceutical industries, edible purposes and provide health benefits to consumers.

Mani *et al*.,(2012) reported that administration of clove tea before or after ethanol administration led to significantly lower in total cholesterol (T.C) and triglycerides(T.G) in rats, so they suggested that prolonged ethanol intake should be avoided when clove tea is consumed daily.

These results in the same line with **(Adefegha*et al*., 2014)**theyreported thatfeeding onclove bud powder (CBP) enhanced hypolepidemic effect (except for high-density lipoprotein cholesterol) in high- fat diet induced hyperlipidemic rats.

Table (2). Serum total cholesterol and triglycerides (mg\dl)of diabetic rats and consumed Syzygiumaromaticum

Groups		T.C (mg\dl)		T.G (mg\dl)	
		Mean±SD	% of change	Mean±SD	% of change
Control (-)		75.33 ^{e}± 5.5	- 37.74	49 ^{c} ± 1	- 31.62
Control (+)		121^{a} ± 5.29	------	71.66^{a} ±1.52	------
Syzygiumaromaticum	3%	112.33^{b} ± 6.42	- 7.16	67^{b} ± 2.64	- 6.5
	5%	95 ^{c} ± 2	- 21.48	62.66^{c} ± 2.08	- 12.5
	7%	87 ^{d}±2.64	- 28	56.66^{d} ± 1.52	- 20.9
	10%	83.33^{d}± 2.08	- 31.13	55.33^{d} ± 1.52	- 22.7
Sig.		*		*	
L.S.D (p≤0.05)		6.89		3.43	

Means in the same row with different litters are significantly different, * Significant ($p \leq 0.05$)

3.3 Serum HDL, LDL, and VLDL (mg\dl) of diabetic rats and consumed Syzygiumaromaticum

Table (3) illustrate the mean value of serum **HDL, LDL,** and **VLDL** (mg\dl) of diabetic rats fed on *Syzygiumaromaticum.*. It could be noticed that (**HDL**) of control (-) group was higher than control (+) group by the ratio of 46.13 %. Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant increases in serum **HDL** compared with the rats injected with Aloxan. The percent of increase as compared to control (+) group were 26.80, 29.92, 33.24, and 37.38 % for*Syzygiumaromaticum*by 3, 5, 7, and 10%, respectively. Non significant differences were observed amongst all treated rats by *Syzygiumaromaticum*. Considering serum **HDL**, *Syzygiumaromaticum.*10 % group recorded the best treatment was observed when compared to control (-) group. Considering serum (**LDL** and **VLDL**). It could be noticed that (**LDL** and **VLDL**) of control (-) group was lower than control (+) group by the ratio of -82.7 % and -31.61% . Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum **LDL** and **VLDL** compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were – 24.78, - 49.75, - 61.11, and – 68.06 % for **LDL** and – 6.48, - 12.56, - 20.93, and – 22.8% for **VLDL** for *Syzygiumaromaticum*by 3, 5, 7, and 10%, respectively. Considering serum **LDL** and **VLDL**, *Syzygiumaromaticum.*10 % group recorded the best treatment was observed for when compared to control (-) group.

Shyamala*et al.*, (2003) reported that clove powder (CP) had a good effects on lipid profile, all parameters registered a tendency towards near normally in rats fed on high fat diet.

This result agree with (**El-Segaey*et al.*, 2007**) they reported that rats fed on 500mg\ kg of clove extract by gastrointestinal tube showed a significantly lower of total cholesterol and triglycerides in hepatotoxicity, this effect due to an antioxidant effect of clove.

Also, this study in the same line with (**Nada, 2011**) she found that clove oil effective in minimizing lipid peroxidation and trace element alteration induced by irradiation.

Elmhdwi*et al.*, (2014) showed thatfixed and volatile oil from*Syzygiumaromaticum*

had significant decrease in serum lipid profile levels as compared with positive group.((T.C, T.C\HDL, LDL, and T.G) were significantly decreased by 29.8, 50, 37.6 and 35.7%, respectively at dose of 15 ml of fixed oil for two weeks. I t also decreased by the same dose of the volatile oil by 25.5, 41.3, 31.4 and 29.4%, while HDL was increased by 41.1 and 27.2% at dose of 15ml of fixed and volatile oil respectively in mice fed on high fat diet.

Table (3). Serum HDL, LDL and VLDL(mg\dl) of diabetic rats and consumed Syzygiumaromaticum

Groups		HDL (mg\dL)		LDL (mg\dL)		VLDL(mg\dL)	
		Mean±SD	% of change	Mean±SD	% of change	Mean±SD	% of change
Control (-)		52.9 ^{a}± 3.22	46.13	12.63 ^{e}±7.08	- 82.07	9.8 ^{e} ± 0.20	- 31.61
Control (+)		36. 2 ^{c} ± 2.43	------	70.46 ^{a} ±7.38	------	14.33 ^{a} ± 0.30	------
Syzygiumaromaticum	3%	45.93 ^{b} ±3.74	26.80	53 ^{b} ± 2.84	- 24.78	13.4 ^{b} ± 0.52	- 6.48
	5%	47.06 ^{ab}± 3.30	29.92	35.4 ^{c} ± 2.00	- 49.75	12.53 ^{c} ± 0.41	12.56
	7%	48.26 ^{ab} ± 3.70	33.24	27.4^{cd} ± 1.90	- 61.11	11.33 ^{d} ± 0.30	20.93
	10%	49.76 ^{ab} ± 3.23	37.38	22.5 ^{d}± 1.05	- 68.06	11.06 ^{d} ±0.30	22.8
Sig.		*		*		*	
L.S.D (p≤0.05)		4.36		8.97		0.68	

Means in the same row with different litters are significantly different, * Significant ($p \leq 0.05$)

3.4GOT, GPT and ALP (U\L) of diabetic rats and consumed Syzygiumaromaticum

Table (4) illustrate the mean value of serum **GOT, GPT,** and **ALP (U\L)** of diabetic rats fed on *Syzygiumaromaticum*.. It could be noticed

that (**GOT**) of control (-) group waslowerthan control (+) group by the ratio of - 49.14%. Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum GOT compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were - 33.66, -38,- 39.51, and - 40.72 % for *Syzygiumaromaticum* by 3, 5, 7, and 10%, respectively.Non significant differences were observed amongst all treated rats by *Syzygiumaromaticum*. Considering serum GOT, *Syzygiumaromaticum*. 10 % group recorded the best treatment was observed when compared to control (-) group.Considering serum (GPT and ALP). It could be noticed that (GPT and ALP) of control (-) group was lower than control (+) group by the ratio of - 31.10 % and – 12.46% . Diabetic rats fed on different percentages of *Syzygiumaromaticum* revealed significant decreases in serum GPT and ALP compared with the rats injected with Aloxan. The percent of decrease as compared to control (+) group were- 20.72, - 24.99, - 28.64, and – 29.87 % for GPT and - 3.98, - 6.73, - - 9.72, and – 11.97% for ALT for Syzygiumaromaticum by 3, 5, 7, and 10%, respectively. Considering serum GPT and ALP, Syzygiumaromaticum. 10 % group recorded the best treatment was observed for when compared to control (-) group.

These results in agreement with **(WahhabandAly, 2005)** they reported that antioxidant property of clove were more effective in liver enzymes in rats during aflatoxicosis.

Adel- Rahman and Abd El-Megeid, (2006)found a marked effect of clove on intoxication mice liver that decreased **GOT** and **GPT** when compared with control positive. This may be explained by prevent of oxidative stress by a high levels of antioxidants in clove (**Abdel-Moemin,2004**)

This study in the same line with (**El-Segaey et al., 2007**) they found that clove had a hepatoprotective effect because it showed a significantly lower level of liver enzymes(**AST, ALT**, and **ALP**) in rats fed on ethanol. And this reduction due to a high levels of antioxidants in clove.

Nada, (2011)showed that rats treated with clove oil before and after whole body gamma irradiation exhibited significant amelioration in liver marker enzymes (**AST**, and **ALT**).

Mani *et al*.,(2012) found that consumption of clove tea before or after ethanol administration had a good effects on liver enzymes in rats, so they suggested that prolonged ethanol intake should be avoided when clove tea is consumed daily in a moderate amount.

Clove bud powder (CBP) had significantly ($P < 0.05$) reduced activity of liver enzymes (alanine aminotransferase, aspartate aminotransferase and alkaline phosphatase) and showed elevated levels of antioxidant status (glutathione, ascorbic acid, superoxide dismutase and catalase)(**Adefegha*et al*., 2014).**

Elmhdwi*et al*., (2014) demonstrated that serum ALT, AST and ALP was lowered by 23.9, 26.2and 35.8%respectively by the fixed oilfrom *Syzygiumaromaticum* and it was also lowered by the volatile oil by 28.8, 27.7, and 33.2% respectively in mice fed onhigh fat diet.

Table (4). GOT, GPT and ALP (U\L) of diabetic rats and consumed Syzygiumaromaticum

Groups		GOT U\L		GPT U\L		ALP U\L	
		Mean±SD	% of change	Mean±SD	% of change	Mean±SD	% of change
Control (-)		56.6 ^{C}± 2.08	- 49.14	37.66 ^{C}± 2.51	- 31.10	117 ^{c} ± 4.58	- 12.46
Control (+)		116.33 ^{a} ± 13.50	------	54.66 ^{a} ±6.5	------	133.66 ^{a} ± 14.04	------
Syzygiumaromaticum	3 %	84 ^{b} ± 4.58	- 33.66	43.33 ^{b} ± 1.52	- 20.72	128.33 ^{ab}± 14.36	- 3.98
	5 %	81.66 ^{b} ± 3.05	- 38	41^{bC} ± 1	- 24.99	124.66 ^{bc} ± 12.85	- 6.73
	7 %	79.66 ^{b} ±3.51	- 39.51	39 ^{C}± 1	- 28.64	120.66 ^{c} ± 12.09	- 9.72
	10 %	76.33 ^{b}± 3.05	- 40.72	38.33 ^{C}± 1.52	- 29.87	117.66 ^{c} ±11.01	- 11.97
Sig.		*		*		*	
L.S.D (p≤0.05)		12.49		3.50		7.61	

Means in the same row with different litters are significantly different, * Significant ($p \leq 0.05$)

Conclusion:

In conclusion, the tested herb in the present study had a good effects in protecting against diabetic rats induced by aloxan. These results supported our hypothesis that clove contain a lot amount of compounds that are able to decrease serum glucose, serum lipids, also it could be improvement liver functions. So, we recommended that our daily diets and drinks should be contained a moderate amount of *Syzygiumaromaticum*.

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التأثير المضاد للسكرى والوقائى للكبد للقرنفل فى الفئران الممحقونه بالألوكسان

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المستخلص العربى

تم اجراء هذه الدراسة لمعرفة التأثيرات المضاد للسكرى والوقائى للكبد لنبات القرنفل على الفئران المحقونهبالألوكسان . تم استخدام ٣٦ فأر أبيض بالغ يتراوح وزن كل منهما عل ١٥٠-١٦٠ جم وتم تقسيمهم الى ٦ مجموعة متساوية احداهما كمجموعة ضابطة سالبة أما المجموعات الأخرى فتم حقنها باستخدام الألوكسان بنسبة ١٥٠مل/كجم من وزن الجسم. وقد أضيف مسحوق البودر المستخدم بنسبة ٣, ٥, ٧, ١٠% من الوجبة الأساسية وذلك لمدة ٤ أسابيع . ,و فى نهاية التجربه تم تجميع عينات الدم لعمل التحاليل التاليه : (الجلوكوز- الكوليستيرول الكلى – الجليسرسداتالثلاثيه – الليبوبروتين المنخفض فالكثافه – الجلوتاميك أوكساليكترانسأمينيز- الجلوتاميك بيروفيكترانسأمينيز- والألكالينفوسفاتيز) كما تم حساب كل من الليبوبروتين المرتفع الكثافهواللليبوبروتين المنخفض جدا فالكثافه. وقد أظهرت نتائج هذه الدراسة أن الفئران المحقونهبالألوكسانأوظهرتزياده معنويه فى مستوى الجلوكوز والكوليستيرول الكلى والجليسرسداتالثلاثيهواللليبوبروتينالمنخفضالكثافهواللليبوبروتين المنخفض جدا فالكثافه بينما انخفاض معنوىفى مستوى اللليبوبروتين المرتفع فالكثافه عند مستوى معنويه ($p<0.005$) , وذللك عندما قورنت بالمجموعهالضابطهالسالبه . وعند معالجة هذه المجموعات المصابه بالسكرى بالقرنفل أدى ذلك الى انخفاض معنوىفى كل التحاليل السابقه وارتفاع فى مستوى الليبوبروتين المرتفع فالكثافه عند مستوى معنويه ($p<0.005$) وذللك مقارنة بالمجموعهالضابطهالسالبه. ولذا خلصت هذه الدراسه الى أن القرنفل له تأثير فعال فى الوقاية من وعلاج السكرى وتخفيض معدلات دهون الدم ووظائف الكبد لذا نوصى بزيادة الاهتمام باستخدام القرنفل بكميات معتدلهفى وجباتنا ومشروباتنا اليوميه.

الكلمات المفتاحية: الفئران المصابه بالسكرى - القرنفل – دهون الدم - وظائف الكبد.