



**Journal of Home Economics**

*Volume 25, Number (4), 2015*

<http://homeEcon.menofia.edu.eg>

---

**Journal of Home  
Economics**

---

ISSN 1110-2578

## **Studing the Effect of Some Plant Seeds on Improving Fertility in Experimental Rats.**

**Mohamed M. El-Sayed, Abeer N. Abd El-Rahman and  
Asmaa S. El-Shamy,**

Department of Nutrition and Food Sci., Faculty of Home Economics, Menoufia Univ.,  
Shebin El-Kom, Egypt

---

### **Abstract:**

This study was conducted to investigate the effect of some plant seeds (*Lettuce and Parsley*) on sexual hormones in male albino rats. Fifteen mature male white albino rats, weighing  $160 \pm 5$ g, rats were divided into 3 groups male each with five rats, all groups were fed for 28 days on experimental diet as follows: Control group was fed on standard diet. Other groups were fed on experimental basal diet with supplementation ratio of seeds i.e. *lettuce* and *parsley* up to 5%. At the end of the experiment, blood samples were collected for determine the following parameters: sexual hormones (testosterone), lipid profile (total cholesterol, triglycerides, lipoproteins: (HDL.C, LDL.C, VLDL.C), kidney functions (urea, creatinin, uric acid), liver functions (GOT, GPT, ALP) and glucose. The obtained results concluding that the feeding with all tested seeds improved sexual hormones, lipid profile, kidney functions, liver functions and glucose. According to these results, *lettuce* and *parsley* could be used for improving sexual hormones.

**Key words:** *lettuce* seeds, *parsley* seeds, sexual hormones, lipid profile, kidney functions, liver functions, glucose.

---

### **Introduction:**

Testosterone is a steroid hormone from the androgen group. In mammals, testosterone is primarily secreted in the testes of males and the ovaries of females, although small amounts are also secreted by the adrenal glands. It is the principal male sex hormone and an anabolic

steroid. Testosterone is evolutionarily conserved through most vertebrates, although fish make a slightly different form called 11-ketotestosterone (*Nelson and Randy, 2005*).

Nowaday medical plants are widespread due to their good effect for treatment of different diseases because they are active ingredients (*ABC, 2005*).

*Lettuce* belongs to *Asteraceae* family and exhibits excellent medicinal properties (*Mou, 2011*). This plant is a rich source of carotene, vitamin C and E. *Lettuce* herb possesses sedative, analgesic, anticonvulsant, hypoglycemic and antifungal properties. Presence of high amount of carotene, Vitamin C and Vitamin E reflects noticeable antioxidant properties (*Garg et al., 2004*). Traditional uses of *lettuce* seed in Iran were applied to relieve inflammation, gastrodynia and osteodynia. It was demonstrated that

methanolic extract of the seed, contains triterpenoids, saponins and simple phenols that possesses antinociceptive and anti-inflammatory effects (*Sayyah et al., 2004*).

*Parsley* is considered as one of the medical plants confirmed by the medical plant sources, all its parts are used such as seeds, leaves, stems and roots for treatment of many cases. The plant consists of many ingredients which have several affect on the live bodies as sex- tonic (*PDR, 1998* ).The herb *parsley* is used for flushing the efferent urinary tract, as a diuretic (*Kreydiyyeh and Usta, 2002*)and for the prevention and treatment of kidney gravel. In folk medicine of many countries, it is used for gastrointestinal disorders and curejaundice (*Kreydiyyeh et al., 2001*).

#### **Materials And Methods:**

##### **Materials:**

##### **The Used Plants:**

*Lettuce* (*Lactuca sativa*) seeds and *Parsley* (*Petroselinum crispum*) seeds were obtained from local market in Shebin El-kom. All seeds (*lettuce* and *parsley*) were dried at room temperature, Then, were grinded in to soft powder and kept in dusky stoppered glass bottles in a cool and dry location till use according to *Russo., (2001)*, who reported that all seeds are pest kept in a cool, dry, and dark location to reduce oxidation of their contents. This seeds were added to basal diet for tested rats at ratio of 5%.

**Experimental Animals:**

Fifteen adult male white albino rats, weighting  $160 \pm 5g$ . Which obtained from Medical Insects Research Institute, Doki, Cairo, were used in this study.

Rats were housed in wire cages (5 rats to each cages), under the normal laboratory condition and were fed on standard diet for one week as an adaptation period. Diet was offered to rats in special feed cups to avoid looser conditions of feeding, water was provided to the rats by glass tubes supported to one side of the cage, feed and water provided ad-labium and checked daily.

**Biological experiments:**

**Basal diet composition of tested rats:**

The basal diet in the experiment consisted of Protein (12%), Corn Oil (10%), Mineral Mixture (4%), Vitamin Mixture (1%), Cellulose (5%), Choline chloride (0.2%), Methionine (0.3%), and the remained of 100 is Corn Starch (69.5%), according to *AIN, (1993)*.

**Experimental design:**

The experimental was done in the Faculty of Home Economics, Menoufia University, Shebin El-kom. Rats (n =15 rats) males were housed in wire cages in a room temperature  $25^{\circ}C$  and kept under normal healthy conditions. All rats were fed on basel diet for one week before starting the experiment for acclimatization. After one week, rats were divided into 3 groups male rats (5 rats each), all groups were fed for 28 days on experimental diet.

**Rats Were Divided Into The Following Groups:**

**Group Of Male Rats:**

**(1) Group:**

Rats Was Fed On Standard Diet Only As Control (Healthy Rats).

**(2) Group:**

Rats Was Fed On Standard Diet Containing 5% *Lettuce* Seeds.

**(3)Group:**

Rats Was Fed On Standard Diet Containing 5% *Parsley* Seeds.

**Biological Evaluation:**

During the experimental period (28days), the diet consumed was recorded every day and body weight was recorded every week. The body weight gain (B.W.G%) and feed efficiency ratio (F.E.R) were calculated according to *Chapman et al., (1959)*.

### **Biochemical Evaluation:**

Blood samples were collected after 12 hours fasting at the end of the experiment using the abdominal aorta in which the rats were scarified under ether anetheized. Blood samples were received in to clean dry centerfuge tubes and left to clot at room temperature, then centerfuged for 10 minutes at 3000 rpm to separate the serum. Serum was carefully aspirate, transferred in to clean cuvet tubes, and stored frozen at -20°C for analysis.

All serum samples were analyzed for determination the following parameters: Testosterone hormone according to *Pradelles et al., (1985)*, total Cholesterol (T.C) according to *Allen, (1974)*, tri- glycerides (T.G) according to *Fassati and prencipe, (1982)*, high density lipo protein (HDL.C) according to *Lopez, (1977)*, low density lipo protein (LDL.C), very low density lipo protein (VLDL.C) according to *Lee and Nieman, (1996)*, urea according to *Patton and Crouch, (1977)*, creatinin according to *Henry, (1974)*, uric acid according to *Schultz, (1984)*, glotamic oxaloacetic transaminas (G.O.T), glotamic pyruvic transaminas (G.P.T) according to *Yound, (1975)* and *Tietz, (1976)*, alkaline phsphatase (A.L.P) according to *Belfied and Goldberg, (1971)*, and glucose according to *Young, (2001)*.

### **Results And Discussion**

#### **Biological Results:**

**-Effect of some plant seeds on body weight gain(B.W.G%), feed intake(F.I) & feed efficiency ratio (F.E.R) of rats.**

**Table (1)** show body weight gain (B.W.G%), feed intake (F.I) and feed efficiency ratio (F.E.R) of rats fed on various diets. As shown in this table, the best group in B.W.G% were in MP5% (Male group fed on *parsley* 5%). The best group in F.I were in MP5% (Male group fed on *parsley* 5%). The best group in F.E.R were in MP5% (Male group fed on *parsley* 5%) when compared with control (+) group.

This result agrees with *Eleiwa et al., (2007)*, they reported that diabetic rats fed on insulin+*lettuce* oil (2%, 4% and 6%) showed a significant decrease in BWG, FI and FER as compared with positive group.

This result agree with *El-kherbawy et al., (2011)*, they indicated that adding *parsley* leaves at 10, 15 and 20% showed significantly

( $P \leq 0.05$ ) lower body weights, feed intake and feed efficiency ratios as compared with the corresponding values of normal or

**Table (1): B.W.G%, F.I and F.E.R for male control group, and all treated groups as affected by some plant seeds.**

Parameters Groups	B.W.G%		F.I (g/day)		F.E.R (rat/28day)	
	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)
Control (MC)	165.98 <sup>a</sup> ± 27.30	-	13.73 <sup>a</sup> ± 0.40	-	12.05 <sup>a</sup> ± 1.40	-
Lettuce 5% (ML5%)	153.8 <sup>ab</sup> ± 11.04	-7.33	13.51 <sup>b</sup> ± 0.27	-1.60	11.36 <sup>b</sup> ± 1.11	-5.72
Parsley 5% (MP5%)	146.93 <sup>b</sup> ± 15.78	-11.47	13.47 <sup>b</sup> ± 0.38	-1.89	10.88 <sup>b</sup> ± 1.37	-9.70

Means in the same row with different litters are significantly differences at ( $p \leq 0.05$ ).

**-Effect of some plant seeds on serum testosterone of rats.**

**Table (2)** indicate serum testosterone of rats fed on various diets. As shown in this table, the best group in serum testosterone were in MP5% (Male group fed on *parsley* 5%) when compared with control (+) group.

This result agrees with *Abdel-Magied and Ahmed, (2011)*, they reported that rats which received *lettuce* oil by 200 mg/Kg body weight then exposed to radiation showing a significant increase in serum testosterone hormone.

This result was agreed with those of *Hefnawy and Mohamed, (2013)*, they showed that supplementation of ethanolic extract of *lettuce* (*Lactuca sativa*) leaves by (100, 150, 200 mg/kg body weight orally) once a week for 10 weeks showed a significant increase in serum level of testosterone hormone.

This result agree with *Akram et al., (2014)*, they reported that injection intraperitoneally once a day by aqueous and hydro-alcoholic extracts of *lettuce* seeds (50, 100 mg/kg) showed an increased serum level of testosterone in mice.

This result was agreed with *Aziza and Mosaad, (2006)*, they indicated that treatment with *parsley* oil (0.6 ml/kg b.w) caused a significant increase in the testosterone concentration as compared to those of the control groups.

Also, this result agree with *Walaa et al., (2015)*, they showed that rats which received ethanol and *parsley* oil for four weeks showed a significant increase in serum testosterone levels as compared with the alcoholic animals.

**Table (2): Fasting serum testosterone for male control group, and all treated groups as affected by some plant seeds.**

Parameters Groups	Testoaterone	
	Mean ±SD	% change of control (+)
Control (MC)	0.70 <sup>b</sup> ± 0.24	-
Lettuce 5% (ML5%)	0.77 <sup>b</sup> ± 0.22	+10
Parsley 5% (MP5%)	0.82 <sup>a</sup> ± 0.29	+17.14

Means in the same row with different letters are significantly differences at ( $p \leq 0.05$ ).

**-Effect of some plant seeds on serum lipids of rats.**

**Table (3)** illustrate serum T.C, T.G, HDL.C, LDL.C and VLDL.C of rats fed on different diets. As shown in this table, the best group in serum T.C were in ML5% (Male group fed on *lettuce* 5%). The best group in serum T.G were in ML5% (Male group fed on *lettuce* 5%). The best group in serum HDL.C were in MP5% (Male group fed on *parsley* 5%). The best group in serum LDL.C were in ML5% (Male group fed on *lettuce*5%). The best group in serum VLDL.C were in ML5% (Male group fed on *lettuce*5%) when compared with control (+) group.

This result agree with *Nicolle et al., (2004)*, they reported that feeding rats a 20% *lettuce* diet for 3 weeks resulted in a marked decrease of liver cholesterol levels.

This result agrees with *Eleiwa et al., (2007)*, they reported that diabetic rats fed on insulin+*lettuce* oil (2%, 4% and 6%) showed a significant decrease in serum triglycerides, LDL and VLDL, elicited significant increase in serum HDL compared with positive group.

This result agrees with *Lee et al., (2009)*, they indicated that daily consumption of 8% freeze-dried red-pigmented leafy *lettuce* showed significantly decreased the level of total cholesterol, LDL-cholesterol,

VLDL-cholesterol and TG, while increased in serum HDL-cholesterol in the plasma of the mice.

Also, results concurred with the finding of *Abdel-Magied and Ahmed, (2011)*, they reported that rats which received *lettuce* oil by 200 mg/Kg body weight then exposed to radiation showing a significant decrease in serum total cholesterol and triglycerides.

The results are the agreement with that of *Yadekari et al., (2013)*, they reported that there were significantly reduced in serum TC, TG, VLDL and LDL, while increased in serum HDL in diabetic mice when received (50, 100 and 200 mg/kg/day) of *lettuce (Lactuca sativa)* by injection.

This result agree with *Shaker et al., (2013)*, they found that rats were fed on basal diet with oral injection of 0.1 ml homocysteine concentrated for (rat weight 150 gm) *lettuce* extract (50 gm /100 mL<sup>-1</sup>EtOH) showed significantly decreased in serum TC, TG, LDL and VLDL, while HDL was significantly increased compared with positive group.

This result agree with *Khudier et al., (2001)*, they indicated that the use of the aqueous *parsley* seeds extract causes a significant decrease in total cholesterol, triglycerides, cholesterol concentration in lipoprotein type VLDL-C and LDL-C in blood plasma of rats.

The results concurred with the finding of *El-kherbawy et al., (2011)*, they indicated that serum TC, TG, LDL-c and VLDL-c of hypercholesterolemic rats fed on diets with 10, 15 and 20% of *parsley* leaves were significantly lower ( $P \leq 0.05$ ) as compared to their corresponding values of the positive control while increase in serum HDL-c.

The results are the agreement with that of *Abdel-Rahim and El-Beltagi, (2011)*, they reported that hypercholesterolemic rats fed on high fat/high cholesterol diet with 10% dried *parsley* showed a significantly decreased in total cholesterol, triglycerides, LDL-C and VLDL-C compared positive control.

**Table (3): Fasting serum T.C, T.G, HDL.C, LDL.C and VLDL.C for male control group, and all treated groups as affected by some plant seeds.**

Parameters Groups	T.C (mg/dl)		T.G (mg/dl)		HDL.C(mg/dl)		LDL.C (mg/dl)		VLDL.C (mg/dl)	
	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)
Control (MC)	162.75 <sup>a</sup> ± 15.90	-	125.25 <sup>a</sup> ± 13.20	-	30.5 <sup>b</sup> ± 4.65	-	168.2 <sup>a</sup> ± 16.27	-	25.05 <sup>a</sup> ± 2.64	-
Lettuce 5% (ML5%)	118.25 <sup>b</sup> ± 12.68	-27.34	113 <sup>b</sup> ± 7.52	-9.78	35.75 <sup>b</sup> ± 6.13	+17.21	131.4 <sup>b</sup> ± 11.46	-21.87	22.6 <sup>b</sup> ± 1.50	-9.78
Parsley 5% (MP5%)	141 <sup>ab</sup> ± 30.88	-13.36	124 <sup>a</sup> ± 12.30	-0.99	44.5 <sup>a</sup> ± 3.87	+45.90	160.7 <sup>a</sup> ± 32.42	-4.45	24.8 <sup>a</sup> ± 2.46	-0.99

Means in the same row with different letters are significantly differences at ( $p \leq 0.05$ ).

**-Effect of some plant seeds on kidney function of rats.**

**Table (4)** indicated that serum urea, creatinin and uric acid of rats fed on various diets. As shown in this table, the best group in serum urea were in ML5% (Male group fed on *lettuce* 5%). The best group in serum creatinin were in MP5% (Male group fed on *parsley* 5%). The best group in serum uric acid were in ML5% (Male group fed on *lettuce* 5%) when compared with control (+) group.

The results concurred with the finding of *Eleiwa et al., (2007)*, they reported that diabetic rats fed on insulin+*lettuce* oil (2%, 4% and 6%) showed a significant decrease in serum uric acid, urea nitrogen and creatinine compared with positive group.

This result agrees with *Shaker et al., (2013)*, they found that rats were fed on basal diet with oral injection of 0.1 ml homocysteine concentrated for (rat weight 150 gm) *lettuce* extract (50 gm /100 mL<sup>-1</sup>EtOH) showed a significant reduction in serum uric acid, creatinine and urea.

The results concurred with the finding of *Abdel-Rahim and El-Beltagi, (2010)*, they showed that rats were fed on high fat / high cholesterol diet with 10% dried *parsley* at the expense of starch showed significantly decreased in urea, creatinine and uric acid in hyperlipidemic and hypercholesterolemic rats.

The results are the agreement with that of *Jafar et al., (2012)*, they showed that rats received 1% ethylene glycol with (200 and 600

mg/kg BW of aerial parts aqueous extract *Petroselinum sativum*) and (200 and 600 mg/kg BW of root aqueous extract *Petroselinum sativum*) in drinking water, respectively were significantly decreased in serum urea, creatinin and uric acid as compared with group ethylene glycol.

This result agrees with *Nabila, (2012)*, she found that rats fed on *parsley* powder (10%), *parsley* extract (25 mg/kg), *parsley* powder + arginine (10% *parsley* powder and 5 g/kg of arginine) and *parsley* extract with arginine (25 mg/kg *parsley* extract with 5 g/kg of arginine) showed a significant decrease in serum urea, creatinine and uric acid compared with control positive group.

This result agrees with *Aml and Alaa, (2013)*, they showed that rats were given orally aqueous infusion of *Petroselinum sativum* (*parsley*) herbs (1 mL/rat, 150 mg/kg b.wt.) along with gentamicin caused a nephroprotective effect evident by significant decreases in the elevated serum urea and creatinin in Gentamicin-treated rats.

This result agree with *Shalaby and Hammada, (2014)*, they reported that rats treated orally with *parsley* leaves extract (100 and 200 mg/kg) for 6 weeks and intoxicated with gentamicin showed *parsley* induced nephroprotective effect evident by significant decreases in serum urea and creatinine.

This result agree with *Nour El-Deen et al., (2015)*, they indicated that rats receiving *parsley* (600 mg/kg), Glycerol (8 ml/kg) and Ethanol (1ml/rat) showed significantly reduced in serum urea and creatinin comparnd with positive control.

**Table (4): Fasting serum urea, creatinin and uric acid for male control group, and all treated groups as affected by some plant seeds.**

Parameters Groups	Urea (mg/dl)		Creatinin (mg/dl)		Uric acid (mg/dl)	
	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)
Control (MC)	55.25 <sup>a</sup> ± 4.27	-	0.98 <sup>a</sup> ± 0.08	-	1.11 <sup>a</sup> ± 0.05	-
Lettuce 5% (ML5%)	42.5 <sup>b</sup> ± 1.29	-23.07	0.93 <sup>ab</sup> ± 0.02	-5.10	0.98 <sup>b</sup> ± 0.07	-11.71
Parsley 5% (MP5%)	44.75 <sup>b</sup> ± 5.90	-19	0.84 <sup>b</sup> ± 0.11	-14.28	1.05 <sup>ab</sup> ± 0.03	-5.40

Means in the same row with different letters are significantly differences at (p ≤ 0.05).

**-Effect of some plant seeds on liver function of rats.**

**Table (5)** illustrate serum GOT, GPT and ALP of rats fed on various diets. As shown in this table, the best group in serum GOT were in ML5% (Male group fed on *lettuce* 5%). The best group in serum GPT were in ML5% (Male group fed on *lettuce* 5%). The best group in serum ALP were MP5% (male group fed on *parsley* 5%) when compared with control (+) group.

The results concurred with the finding of *Eleiwa et al., (2007)*, they reported that diabetic rats fed on insulin + *lettuce* oil (2% and 6%) showed a significant decrease in serum ALP, AST and ALT level as compared with positive group.

The results are the agreement with that of *Shaker et al., (2013)*, they found that rats were fed on basal diet with oral injection of 0.1 ml homocysteine concentrated for (rat weight 150 gm) *lettuce* extract (50 gm /100 mL<sup>-1</sup>EtOH) showed a significant reduction in serum GOT, GPT and ALP.

The results concurred with the finding of *Al-Howiriny et al., (2003)*, they showed that rats treated with CCl<sub>4</sub> were fed on ethanolic extract of *Parsley* (1 and 2 g/kg b.w.) showed a significant decrease in the serum levels of GOT, GPT and ALP compared with positive group.

Also, results are the agreement with those of *Bolkent et al., (2004)*, they found that diabetic rats treated with *parsley* showed significantly lower in levels of alanine transaminase (ALT) and alkaline phosphatase (ALP).

The results are the agreement with those of *Ahmed et al., (2010)*, they showed that rats treated with (tween 80, p.o.) received a single dose of cisplatin by (7.5 mg/kg b.w., i.p.) plus *Petroselinum sativum* (250mg/kg b.w.) by oral administration alone or in combination with silymarin (70mg/kg b.w.) showed significantly decreased in serum AST and ALT compared with positive control.

This result agrees with *Abdel-Rahim and El-Beltagi, (2010)*, they showed that rats were fed on high fat / high cholesterol diet with 10% dried *parsley* at the expense of starch showed significantly decreased in serum GOT, GPT and ALP in hyperlipidemic and hypercholesterolemic rats.

The obtained results agrees with *El-kherbawy et al., (2011)*, they indicated that adding *parsley* leaves at 10, 15 and 20% showed

significantly ( $P \leq 0.05$ ) lower AST and ALT as compared to their corresponding values of the positive control.

This result agree with *Khudiar and Ahmad, (2012)*, they showed that rats were given orally 150 mg/kg B.W. of flavonoids (apigenin) extracted from *parsley* in addition to 50 ppb of CdCl<sub>2</sub> in drinking water showed a significant decrease in serum ALT, AST and ALP comparad with positive group.

This result agree with *Jafar et al., (2012)*, they showed that rats received 1% ethylene glycol with 200 mg/kg BW of aerial parts aqueous extract *Petroselinum sativum* and 200 mg/kg BW of root aqueous extract *Petroselinum sativum* in drinking water, respectively were significantly decreased in serum AST and ALT as compared with group ethylene glycol. While rats received 1% ethylene glycol with 600 mg/kg BW of aerial parts aqueous extract *Petroselinum sativum* in drinking water, were significantly decreased in serum ALT.

This result agree with *Aml and Alaa, (2013)*, they showed that rats were given orally aqueous infusion of *Petroselinum sativum* (*parsley*) herbs (1 mL/rat, 150 mg/kg b.wt.) along with gentamicin caused a nephroprotective effect evident by significant decreases in the elevated serum ALP activity in Gentamicin-treated rats.

This result agree with *Shalaby and Hammada, (2014)*, they reported that rats treated orally with *parsley* leaves extract (100 and 200 mg/kg) for 6 weeks and intoxicated with gentamicin showed *parsley* induced nephroprotective effect evident by significant decreases in serum alkaline phosphatase.

**Table (5): Fasting serum GOT, GPT and ALP for male control group, and all treated groups as affected by some plant seeds.**

Parameters Groups	GOT (U/L)		GPT (U/L)		ALP (U/L)	
	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)	Mean ±SD	% change of control (+)
Control (MC)	278 <sup>a</sup> ± 31.48	-	73 <sup>a</sup> ± 22.53	-	396.75 <sup>a</sup> ± 67.71	-
Lettuce 5% (ML5%)	214.25 <sup>b</sup> ± 23.17	-22.93	48.5 <sup>b</sup> ± 7.93	-33.56	331.25 <sup>b</sup> ± 47.77	-16.50
Parsley 5% (MP5%)	228.25 <sup>b</sup> ± 57.42	-17.89	56 <sup>b</sup> ± 14.28	-23.28	288 <sup>b</sup> ± 20.49	-27.41

Means in the same row with different letters are significantly differences at ( $p \leq 0.05$ ).

**-Effect of some plant seeds on serum glucose of rats.**

**Table (5)** reveal serum glucose of rats fed on different diets. As shown in this table, the best group in serum glucose were in MP5% (male group fed on *parsley* 5%) when compared with control (+) group.

This result disagrees with **Roman et al., (1995)**, they reported that the hypoglycemic effects of *Lactuca sativa* and some other plants showed that this herb does not reduce blood sugar in the normal rabbits.

The results are the agreement with that of **Hou et al., (2003)**, they showed that some materials (sesquiterpene lactone and lignin) isolated from different species of *lettuce (Lactuca indica)* caused a significant reduction of blood glucose.

The results concurred with the finding of **Eleiwa et al., (2007)**, they reported that diabetic rats fed on insulin + *lettuce* oil (2%, 4% and 6%) showed significantly decreased in serum glucose level compared with positive group.

This result agrees with **Yadekari et al., (2013)**, they reported that there were a significantly decreased in serum glucose in diabetic mice when received (50, 100 and 200 mg/kg/day) of *lettuce (Lactuca sativa)* by injection.

This result agrees with **Bolkent et al., (2004)**, they found that diabetic rats treated with *parsley* showed significantly lower in levels of blood glucose.

The obtained result agree with **Shalam and Omar, (2015)**, they reported that using different doses of extract of *parsley* leaves by 200, 400 and 800 mg/ml were carried against a sucrose load of 2.5 g/kg body weight in rats showed a reduction in glucose level at intervals of 30, 60, 120 and 180 mins.

This result agree with **Nasser et al., (2016)**, they reported that diabetic rats were treated orally with *Petroselinum sativum* leaf aqueous extracts (2 g/kg BW daily for 45 days) showed a significant decreased in serum glucose in diabetic mice.

**Table (5): Fasting serum glucose for male control group and all treated groups as affected by some plant seeds.**

Parameters Groups	Glucose (mg/dl)	
	Mean ±SD	% change of control (+)
Control (MC)	84.75 <sup>a</sup> ± 2.75	-
Lettuce 5% (ML5%)	80 <sup>b</sup> ± 3.26	-5.60
Parsley 5% (MP5%)	76.25 <sup>b</sup> ± 2.5	-10.02

Means in the same row with different litters are significantly differences at ( $p \leq 0.05$ ).

#### References

- ABC (American Botanical Council) . (2005):** Integrative medical communication monographs. Austin.,  
<http://www.abc@herbalgram.com>
- Abdel-Magied, N. and Ahmed, A.G. (2011):** The Protective Role of Lettuce oil (*Lactuca sativa*) against Radiation induced Biological Hazards in Male Rats. *J. Rad. Res. Appl. Sci.*, 4(3): 923 -938.
- Abdel-Rahim, E. A. and El-Beltagi, H. S. (2010):** Constituents of apple, parsley and lentil edible plants and their therapy treatments for blood picture as well as liver and kidneys functions against lipidemic disease. *Electronic Journal of Environmental, Agricultural and Food Chemistry.*, 9(6):1117-1127.
- Abdel-Rahim, E. A. and El-Beltagi, H. S. (2011):** "Alleviation of hyperlipidemia in hypercholesterolemic rats by lentil seeds and apple as well as parsley in semi-modified diets". *Advances in Food Sciences.*, 33(1): 1-7.
- Ahmed, N. Z.; El-Deib, K. M. and Ahmed, M. M. (2010):** Studies on *Curcuma longa*, *Chicorium intybus* and *Petroselinum sativum* water extracts against Cisplatin-Induced Toxicity in Rats. *Journal of American Science.*, 6(9): 545-558.

- AIN (American Institute of Nutrition). (1993):** Purified diet for laboratory Rodent, Final report. J. Nutrition. 123:1939-1951. and *O. compactum* Benth. J. essential oil Res., 8(6): 657-664.
- Akram, A.; Ali, A. O. and Maryam, R. (2014):** Effect of aqueous and hydro-alcoholic extracts of lettuce (*Lactuca sativa*) seed on testosterone level and spermatogenesis in NMRI mice. Iran. J. Reprod. Med., 12(1): 65–72.
- Al-Howiriny, T.; Al-Sohaibani, M.; El-Tahir, K. and Rafatullah, S. (2003):** Prevention of experimentally-induced gastric ulcers in rats by an ethanolic extract of “Parsley” *Petroselinum crispum*. Am. J. Clin. Med., 31(5): 699-711.
- Allen, C. C. (1974):** Cholesterol enzymatic colorimetric method. J. of Clin. Chem., (20): 470.
- Aml, F. E. and Alaa, O. A. (2013):** Nephroprotective and diuretic effects of three medicinal herbs against gentamicin-induced nephrotoxicity in male rats. Pakistan Journal of Nutrition., 12 (8): 715-722.
- Aziza, M. H. and Mosaad, A. A. (2006):** Antioxidant effect of parsley and *Panax ginseng* extract standardized with ginsenosides Rg3 against alteration induced in reproductive functions in male mice. The Egyptian Journal of Hospital Medicine., ( 22) : 60 – 72.
- Belfied, A. and Goldberg, D. M. (1971):** Alkaline phosphatase colorimetric method. J. of Enzyme., (12): 561.
- [Bolkent, S.](#); [Yanardag, R.](#); [Ozsoy-Sacan, O.](#) and [Karabulut-Bulan, O.](#) (2004):** Effects of parsley (*Petroselinum crispum*) on the liver of diabetic rats: A morphological and biochemical study. [Phytother Res.](#), 18(12):996-9.
- Chapman, D. G.; Castilla, R. and Campbell, J. A. (1959):** Evaluation of protein in food. I.A. Method for the determination of protein efficiency ratio-Can. J. Biochemistry. Physiology., 37: 679-686.
- Eleiwa, N. Z. H.; Salem, I. S. and Sherein, S. A. E. G. (2007):** Biological and chemo-pathological comparative study on the effect of insulin and lettuce oil on experimentally-induced diabetic rats. Zagazig. J. Pharm. Sci., 16(2): 17-26.
- El-Kherbawy, G. M.; Ibrahim, E. S. and Zaki, S. A. (2011):** Effects of Parsley and Coriander leaves on hypercholesterolemic rats.

Home Economic Division, Food Technology Dept ., Faculty of Agric., Cairo University Agricultural Research Center,Giza.

- Fassati, P. and Prencipe, L. (1982):** Triglyceride enzymatic colorimetric method. *J. of Clin. Chem.*, (28): 2077.
- Garg, M.; Garg, C.; Mukherjee, P. K. and Suresh, B. (2004):** Antioxidant potential of *Lactuca sativa*. *Ancient Science Life.*, 24(1): 6-10.
- Hefnawy, T. M. H. and Mohamed, F. R. (2013):** Protective effects of *Lactuca sativa* ethanolic extract on carbon tetrachloride induced oxidative damage in rats. *Asian. Pac. J. Trop. Dis.*, 3(4): 277–285.
- Henry, R. J. (1974):** *Clinical Chemistry Principal and Techniques*. 2nd ed. Harper and Publisher. New York.
- Hou, C.C.; Lin, S.J.; Cheng, J.T. and Hsu, F.L. (2003):** Anti diabetic dimeric guanolides and a lignin glycoside from *Lactuca indica*. *J. Nat. Prod.*, 66(5): 625-629.
- Jafar, S.; Mehri, L.; Hadi, B. and Jamshid, M. (2012):** The antiurolithiasic and hepatocurative activities of aqueous extracts of *Petroselinum sativum* on ethylene glycol-induced kidney calculi in rats. *Scientific Research and Essays.*, 7(15):1577-1583.
- Khudiar, K. K. and Ahmad, A. K. (2012):** Protective effect of flavonoids extracted from parsley (*Petroselinum sativum, L.*) leaves on liver function in male rats exposed to cadmium chloride. *Iraqi. J. Biotech.*, 11(1): 90 – 108.
- Khudier, K. K.; Abdulla, B. N. and Al-Mazin, K. A. (2001):** The protective effect of the aqueous extract of parsley (*Petroselinum sativum*) seeds on experimentally –induced oxidative stress in rats. *Iraqi. J. Vet.*, 25(1): 153- 172.
- Kreydiyyeh, S. I. and Utsa, J. (2002):** Diuretic effect and mechanism of action of parsley. *J. Ethnopharmacol.*, 79(3): 353-357.
- Kreydiyyeh, S. I.; Utsa, J.; Kaouk, I. and Al-Sadi, R. (2001):** The mechanism underlying the laxative properties of parsley extract. *Phytomedicine.*, 8(5): 382-388.
- Lee, J. H.; Penelope, F. P.; Yoon, H. Y.; Mi, Y. K.; Oh, Y. K.; Dai, E. S.; Hyoung, C. K. and Mee, R. K. (2009):** Effects of dietary supplementation with red-pigmented leafy lettuce (*Lactuca sativa*) on lipid profiles and antioxidant status in C57BL/6J mice

fed a high-fat high-cholesterol diet. *Food and Nutrition J.*, 101(8): 1246-54.

**Lee, R. and Nieman, D. (1996):** National Assessment. 2nd Ed., Mosby, Missouri, USA.

**Lopez, M. F. (1977):** HDL-cholesterol colorimetric method. *J. of Clin. Chem.*, P: 230- 282.

**Mou, B. (2011):** Mutations in lettuce improvement. *Int. J. Plant Genom.*, P: 1–7.

**Nabila, M. R. (2012):** Biological study on the effect of arginine and parsley on renal toxicity in rats. *World Journal of Medical Sciences.*, 7(4): 264-269.

**Nasser, S. A.; Alaa, S. A.; Salwa, I. A. W.; Ibtisam, M. H. E.; Mohamed, Y. H. and Hussein, M. A. (2016):** Antidiabetic and Antioxidant Impacts of Desert Date (*Balanites aegyptiaca*) and Parsley (*Petroselinum sativum*) Aqueous Extracts: Lessons from Experimental Rats. *Journal of Diabetes Research.*, P:1-10.

**Nelson. and Randy, F. (2005):** An introduction to behavioral endocrinology. Sunderland, Mass. Sin. Associates., P: 143.

**Nicolle, C.; Cardinault, N.; Gueux, E.; Jaffrelo, L.; Rock, E.; Mazur, A.; Amouroux, P. and Remesy, C. (2004):** Health effect of vegetable-based diet: Lettuce consumption improves cholesterol metabolism and antioxidant status in the rat. *Clin Nutr.*, 23: 605–614.

**Nour El-Deen, M.; Awad, A. S.; Abdel-Rahman, R. F.; Salem, H. A. and Kenawy, S. A. (2015):** The possible effects of thymoquinone and parsley in experimentally induced renal injury associated with gastric ulcer in rats. *International Journal of Advanced Research.*, 3(6): 413-426.

**Patton. C. J. and Croush, S. R. (1977):** Enzymatic Determination of Urea. *J. Anal. Chem.*, 49: 464-469.

**PDR (Physician Desk Reference). (1998):** Herbal Medicine 1st Ed., Medical Economic Company., P: 1022- 1025.

**Pradelles, P.; Grassi, J. and Maclouf, J. A. (1985):** Enzyme immunoassays of eicosanoids using acetylcholine esterase as label. *J. Anal. Chem.*, 57:1170-1173.

- Roman-Ramos, R.; Flores-Saenz, J. L. and Alarcon-Aguilar, F. J. (1995):** Anti-hyperglycemic effect of some edible plants. *J. Ethnopharmacol.*, 48(1): 25-32.
- Russo, E. (2001):** "Hand book of Psychotropic Herbs A scientific Analysis of Herbal Remedies for Psychiatric conditions". The Howrth Herbal press. Inc.
- Sayyah, M.; Hadidi, N. and Kamalinejad, M. (2004):** Analgesic and anti inflammatory activity of *Lactuca sativa* seed extract in rats. *J. Ethnopharm.*, 92: 325-329.
- Schultz, A. (1984):** Uric Kaplan A. Clin Chem. Mosby Co. St. Louis Toronto. Princeton., P: 1261-1266, 418.
- Shaker, E.; Manaa, S.; Mubarak, A. and HadyFerdous, A. E. (2013):** Hypo-Homocysteinemia Effect for Some Ethanolic Plant Extracts. *J. Nutr. Food Sci.*, P: 3-200.
- Shalaby, M. A. and Hammoda, A. A. (2014):** Evaluation of nephroprotective and diuretic effects of parsley and turmeric herbs on gentamicin nephrotoxic rats. *World Journal Of pharmacy And Pharmaceutical Sciences.*, 3(12): 1729-1744.
- Shalam, M. H. and Omar, A. (2015):** Inhibition of  $\alpha$ -glucosidase enzyme by Parsley *Crispum L.* leaf extract: Possible role in controlling postprandial hyperglycemia. *J. Pharm. BioSci.*, 2: 30-35.
- Tietz, N. W. (1976):** Fundamentals of Clinical Chemistry. Philadelphia. B.W. Standers., P: 243.
- Walaa, G. H.; Momtaz, Y. H. and Hanan, A. S. (2015):** Effects of parsley and pumpkin on alcohol induced testicular damage in rat model. *Journal of International Academic Research for Multidisciplinary.*, 2(12): 2320-5083.
- Yadekari, L.; Modaresi, M. and Majlesi, M. (2013):** The effect of hydro-alcoholic extract of lettuce on blood parameters in mice. *Journal of Biological Sciences.*, 8(2): 42-45.
- Yound, D. S. (1975):** Determination of GOT. *Clin. Chem.*, 22(5): 21.
- Young, D. S. (2001):** "Effect of Disease on Clinical lab" Testes, 4th Ed AA CC.
-

## دراسة تأثير بذور بعض النباتات في رفع مستوى الخصوبة في فئران التجارب

محمد مصطفى السيد ، عبير نزيه عبد الرحمن، أسماء صبحي عبدالله على محمد الشامي  
قسم التغذية وعلوم الاطعمة، كلية الاقتصاد المنزلي، جامعة المنوفية، شبين الكوم، مصر

### الملخص العربي :

تهدف هذه الدراسة الى معرفة التأثيرات المحتملة لبذور بعض النباتات (الخس والبقدونس) على الهرمونات التناسلية في ذكور فئران الألبينو. تم استخدام ١٥ فأراً ألبينو أبيض بالغ يتراوح وزن كل منهما على  $160 \pm 5$  جم وتم تقسيمهم الى ٣ مجموعات ذكور كل منها ٥ فئران. تم تغذية جميع المجموعات لمدة ٢٨ يوماً على اتباع نظام غذائي تجريبي على النحو التالي : تم تغذية المجموعة الضابطة على نظام غذائي موحد. تم تغذية المجموعات الأخرى على اتباع نظام غذائي تجريبي مع نسبة مكملات من البذور تصل إلى ٥٪. في نهاية فترة التجربة تم تجميع عينات الدم وذلك لقياس الهرمونات التناسلية (التستوستيرون) ودهون الدم {الكوليستيرول الكلى والجليسيريدات الثلاثية و الليبوبروتينات (الليبوبروتينات عالية الكثافة، الليبوبروتينات منخفضة الكثافة، الليبوبروتينات المنخفضة جدا في الكثافة)} ووظائف الكلى (اليوريا، الكرياتينين، حمض اليوريك) ووظائف الكبد (الجلوتاميك أوكساليك ترانس أمينيز، الجلوتاميك بيروفيك ترانس أمينيز، الألكالين فوسفاتيز) والجلوكوز. وقد أظهرت نتائج هذه الدراسة أن تناول تلك البذور النباتية نتج عنه تحسن في الهرمونات التناسلية ودهون الدم ووظائف الكبد والكلى والجلوكوز. ووفقاً للنتائج الخس والبقدونس يمكن استخدامها لتحسين الهرمونات التناسلية.

**الكلمات المفتاحية:** بذور الخس- بذور البقدونس- الهرمونات التناسلية- دهون الدم- وظائف الكلى- وظائف الكبد- الجلوكوز.