

EFFECT OF PALM POLLEN GRAINS EXTRACTS (*Phoenix dactylifera L*) ON SPERMATOGENIC ACTIVITY OF MALE RABBITS

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ABSTRACT

The effect of palm pollen grain extracts (*Phoenix dactylifera L*) on the spermatogenic activity has been studied by observation of the sperm characteristics, weights of testes and the histological development which begins at the testes wall tubules as a primary and secondary spermatocytes. Fifteen male rabbits were divided into three equal groups, the first control group received (3ml) of normal saline, the second treated with 5 ml/kg Body weight of palm pollen extract, While the third group treated with 25ml/Body weight of the extract.

Palm pollen grain extracts increase the sperm cells count and decreased the percentage of motile sperm in male rabbits, On the other hand the palm pollen grain extracts has showed a significant increase in spermatogenesis at seminal tubules by increasing the primary and secondary spermatocytes in comparing with control animals.

1-INTRODUCTION

For centuries, the date palm (*Phoenix dactylife*) has been used in the middle East as a tonic main food, the date is an alleged aphrodisiac and symbol of fertility (Rajiv 2002). The Arab belief that drinking date pollen juice improves the chances of bearing children, many investigators shows that pollen contains estrogen-like hormones (Ali et. al. 1999). Phytochemical studies of date palm pollen grains have revealed the presence of sterols, oestrone like compounds and steroidal saponin glycoside (Amin et.al. 1969; Mahran et al, 1976; Kikuchi and Miki, 1978)

Experimentally; date extracts have been show sperm count increase in guinea pigs and to enhance spermatogenesis enhancement and increase the concentration of testosterone, follicle stimulating hormone and leutelizing hormone in rats (El-Mougy et al, 1999) .Therefore ,we sought to assess the effect of date pollen on the spermatogenic activity in male rabbits.

2-MATERIAL AND METHODS

2-1 Extraction of Plant;

The plant materials (Spadex) were obtained from the local Basra market, and the Spadex were separately minced and extracted with 1.5 liter of 75% Methanol for 8 hours, and then was filtered. The crude extract was obtained after remove the solvent by vacuum distillation, The dry crude extract yield was 10% (Harborne, 1984).

2-2 Animals:

Fifteen Male Rabbits , 18 to 20 weeks of age and weighing 950 to 1000 g, were housed at room temperature under natural photoperiod, and maintained on standard pellet diet and tap water (Alleva, 1968).

The animals were randomly divided into three equal groups, The first control group received 3 ml of normal saline, the second treated with 5 ml of Date Palm pollen grain extract, While the third group treated with 25 ml. After eight weeks of the treatments the rabbits were anesthetized and scarified, the semen of each animal was obtained from the penis by squeezing the prostate and epididymus and examined immediately for sperm motility and sperm density by haemocytometer.

The testes of each animal were removed and weighed .Sections from each testes were prepare after fixed in Bouins fixative, passed through a series of ethanol and xylene for histological examination (Luna, 1962)

3- RESULTS

The effect of Date Palm Pollen grain extract on sperm characteristics is present in the Table 1 which show a significant increase ($p < 0.01$) in sperm cell concentration (Total count) and motility.

The average testicle weigh of the rabbit in control group and the first and second treated groups are presented in (Table 1). The comparison of the testicles mass in the control group with the masses of the rabbits which used the extract of pollen grains, they showed significant increase of the testicles. (Fig:1,2).

After histological research of removed organs and evaluation it was stated that in the testicles of control group rabbits the incisions of the spermatic tubules were clearly seen (Fig:3). Between the tubules thin interstitial tissue with blood vessels and leydig cells can be seen. The tubules are surrounded by connective tissue properia, from which a thin basic membrane stretches inside, on which spermatogenic epithelium is set out. It can be seen that next to the basic membrane spermatogonia, between which the cores (the lighter ones) of Sertoli cells can be seen. Spermatogonia are small round cells. a narrow stripe of cytoplasm can be seen around their cores. It is noticeable that the spermatic tubules are different in their structure depending on the phase of spermatogenesis, while penetrating inside the spermatic tubules, behind the spermatogonia in the initial stage of spermatogenesis primary spermatocytes can be well seen. These are biggest cells of spermatic tubules. Furthermore towards the radius smaller cells are situated secondary spermatocytes and finally spermatids, which occupy the inner layer of spermatic tubules. The spermatozoids are accumulated in the radius of a tubules with their prolonged heads sticking out from the cytoplasm of the Sertoli cells and their tails directed towards the radius of the tubules.

In the histological preparations of rabbits in the first and second treated groups show a significant increased in the numbers of primary, secondary spermatocytes and spermatids could be distinguished in comparison with control group. (Figures 3,4 and 3), While the number of spermatogonia and Sertoli cells remained unchanged, On the other hands, there was increased in the mature leydig cells and reduction in the spermatogenic cells (Fig:5,6,7).

The date pollen grains extract caused a significant increase ($P < 0.03$) in sperm cell concentration (total count) and reduced motile sperms., the reduction in spermatogenic cells may be due to insufficient amount of testosterone, spermatogenesis is activated by testosterone which is synthesized by leydig cells and act on Sertoli cells.

Table (1): Semen characteristics of control and treated RabbitsSemen Characteristics (means \pm SE)

Groups	Motile (Total%)	Total Count (10^6)
Control	63 \pm 0.3	363 \pm 7
Treatment (5ml)	49 \pm 0.3	391 \pm 5
Treatment (25ml)	23 \pm 0.3	466 \pm 6

Table (2): Testes Weights (g)

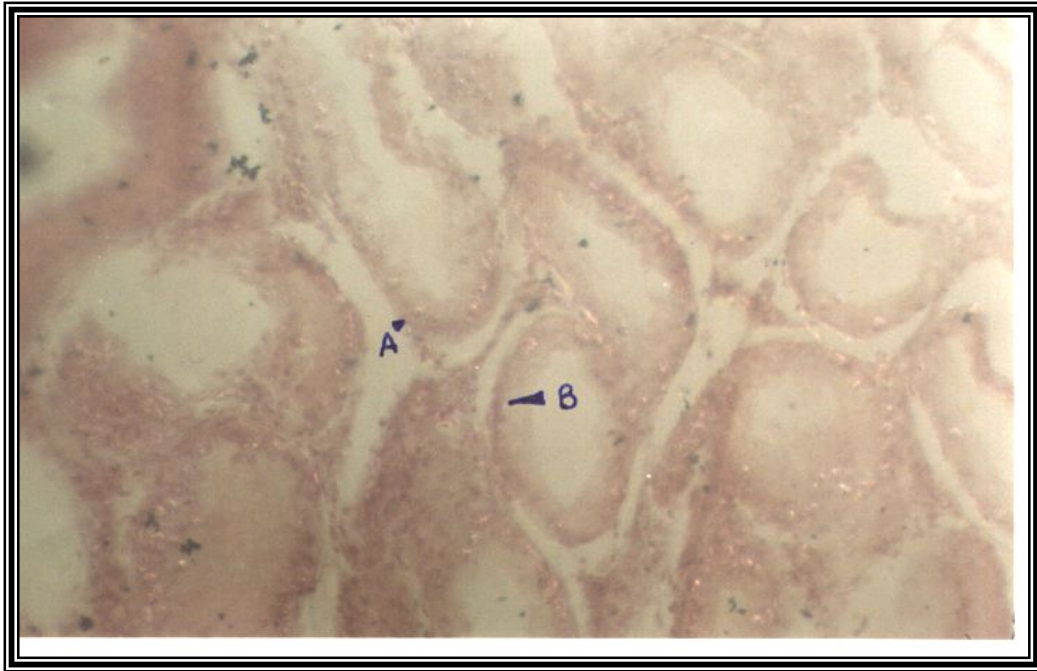
Groups	Right testis	Left testis
Control	2.08	2.03
Treatment (5ml)	2.083	2.58
Treatment (25ml)	3.03	2.95



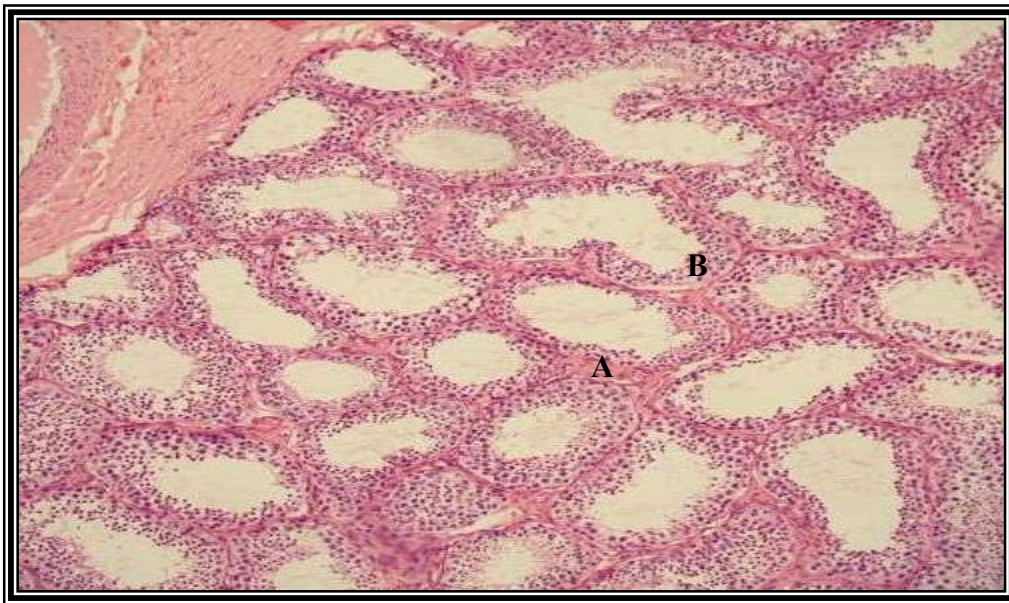
Fig (1): Control group Rabbit testis showing their normal size



Fig (2): Treated testis (25ml) showing increased their size



**Fig (3): Seminiferous tubules of control group shows A,B-Spermatogonia
H&E 400X**



**Fig (4): Cross section in control Group testis
A-Seminal Tubules B-Connective Tissue
X H&E Stain 100**

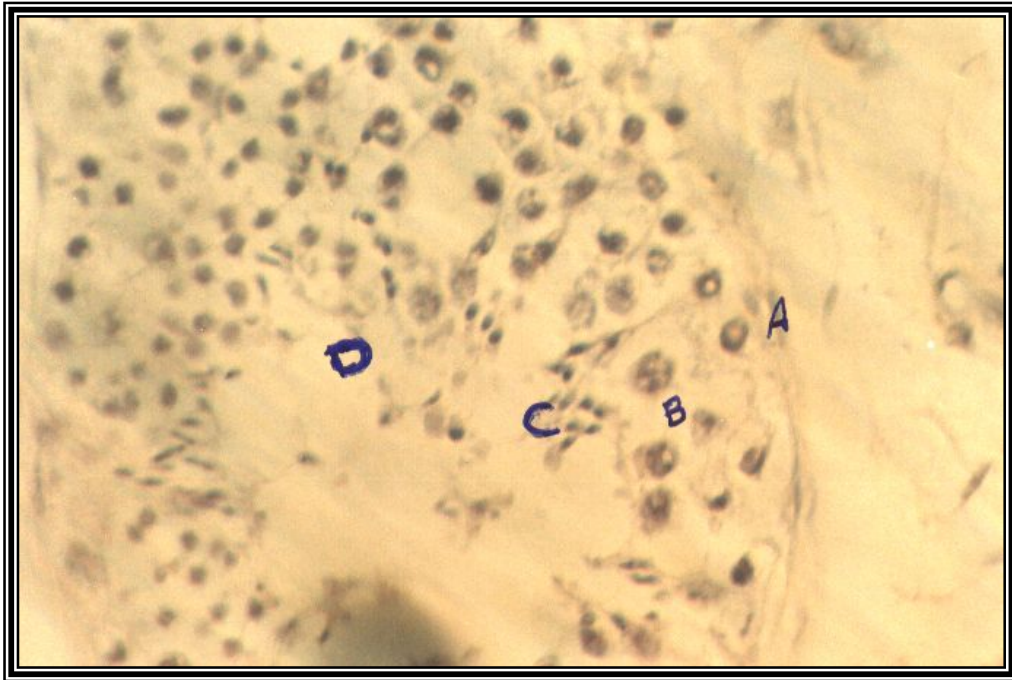


Fig (5): Control group testis
A-Spermatogonia, B-Spermatocyte ,C,D-Spermatozoa
H&E 1000X

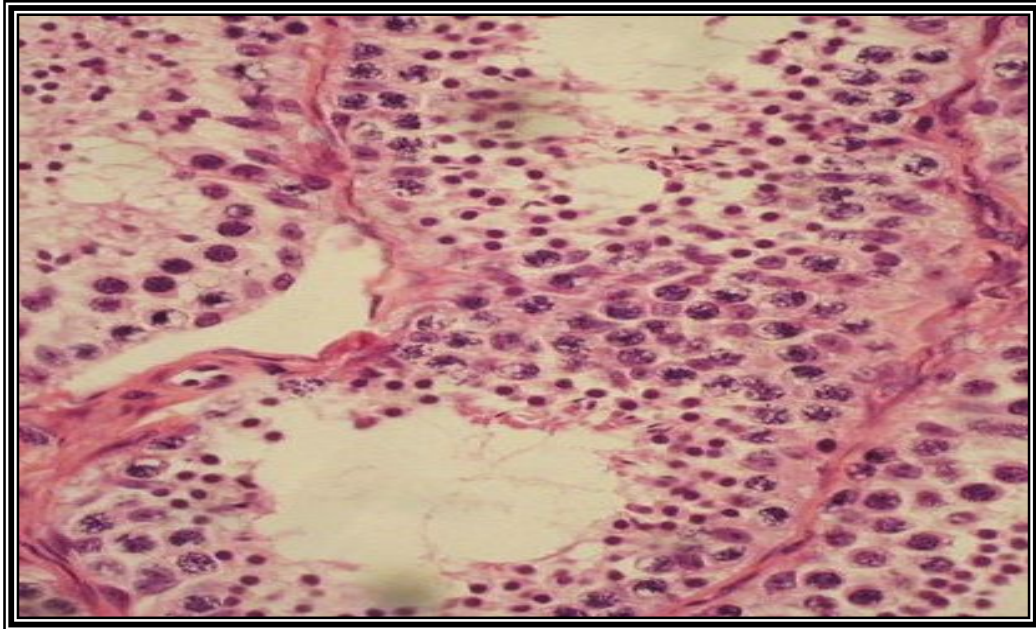
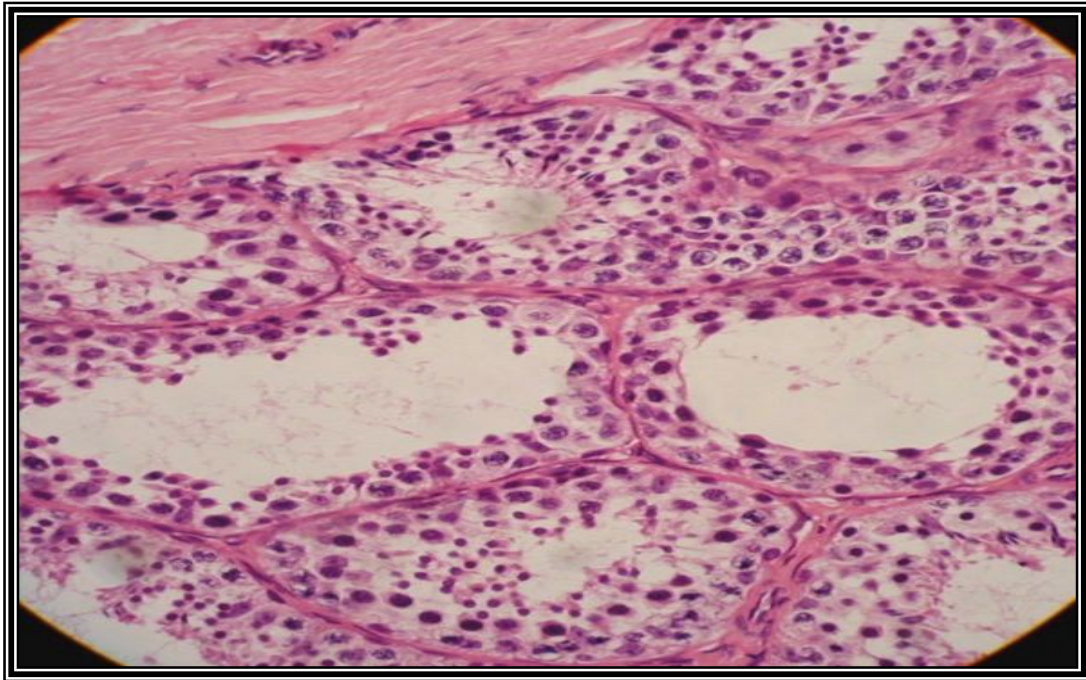


Fig (6): Treated group testis Shows increased the number of primary and secondary spermatocytes H&E 600X



**Fig (7): Treated group testis shows increase in mature lydic cells
And reduction in spermatogenic cells.
H&E 600X**

4-DISCUSSION

The result indicates that palm pollen grain extract affects testicle of rabbits, its increase the weight of this organs, there are significant increase in sperm cells concentration , on the other hand, increased sperm cell count but decrease percentage of motile sperms. It seems that presence of estrogen-like hormones in the pollen grains (Herbsphare,2005). Might be responsible for that observation.

The variations shows that the palm pollen grain extract is distinguished by gradual androgenic effect, which is noticed consuming the preparation from 5 mg and 25 mg treated animals and affects the organs that produces male sexual hormones testosterone.(Cerniauskiene and Luksiene,2003; Praskevicius et al 2002).

Palm pollen grain extract gave significant increase of the testicle mass, while(Verma et.al.2002,Skaudikas et.al.2004) shows that there are a significant decrease in the weight of this organs in male rats with some plants.

In the treated groups, there was a significant excess in the number of primary and secondary spermatocytes and round spermatids, while the number of the sertoli cells and spermatogonia remained unchanged.

(El-mougy et. al.1991) reported increase sperm count in guinea pigs and to enhance spermatogenesis and increase the concentration of testosterone follicle stimulating hormones, and luteinizing hormones in rats .

The results obtained in the present study strongly call for further studies on the physiological effect and mode of action of date palm grain extract.

REFERENCES

- Ali** B.H.,basher A.K. Al-Hadrami G.1999.reproductive hormonal status of rats Treated with date pits . Food Chem. 66;437-441.
- Alleva** j.j.;Waleski,M.V.;Alleva,F.R. and umberger,E.J. 1968.Synchronizing effect Of photoperiodicity on ovulation in hamster. Endocrinology .82:123-127.
- Amin** E.S.,Awad O.,abdel samad M. and Iskander m.N. 1969.Isolation of estrone From moghat roots and from pollen grains of Egyptian date palm, Phytochem.9;295-297.
- Cerniauskiene** L.R.,Luksiene D.K. 2003 . phytosterols decrease small density Lipoproteins,cholesterol concentration in serum blood Gydymo menas 97;6-75.
- El-mougy**, S.A.,Abdel Aziz,S.A. Al-Shanawany M. Omar A.1991.The Gonadotropic activity of palmae in mature male rats.Alexandria j.Pharmac Sci.5;156-159.
- Harborne** j.B.1989.Phytochemical methods.2nd Champon and Hall,New york, U.S.A.
- Kikuchi** N. Miki T. 1978.the separation of date sterols by liguid chromatography Mikrochimica Acta.2;89-96.
- Luna** I.G. 1062. manual of histological staining methods of armed institute of Pathology.3rd ed.MC .Grawl till book company. New York,U.S.A.
- Mahran** g.H. Abdel Wahab S.M. Attia A.M. 1976. A phytochemical study of date Palm pollen. Plant.med. 29;171-175.
- Praskevicius** A. Lukosevicius L. Burneckiene J. Rodovicius H. Dudenase H. 2002. Hormonai(Hormones) Kaunas.198-212.
- Rajiv** M. 2002. Arabia is the home of the date palm .Internet ;www.hinduonnet.com /thehindu/thscrip.2005.
- Skudickas** D.Kondrotas A.J.Baltrusaitis K.Vaitiekaitis G.2003.Effect of Echinacea purpurea l. moench preparation on experimental prostate gland.Medicina .39;(8) 761-766.
- Verma** P.K. Sharma A. Mathur A. Sharma P. Gupta R.S.Joshi S.C. Dixit V.P. 2002.Effect of sarcostemma acidium stem extract on spermatogenesis. Asian J. Androl.1;43-47.

تأثير مستخلص حبوب لقاح طلع النخيل على عملية تكوين الحيوانات المنوية في ذكور الارانب

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الخلاصة

تمت دراسة مستخلص حبوب لقاح طلع نخيل التمر على عملية تكوين النطف في ذكور الارانب من خلال ملاحظة صفات السائل المنوي , واوزان الخصى والحوادث الدورية في النبيبات الناقلة للحيامن خلال زيادة الخلايا النطفية الاولية والثانوية. استخدمت خمسة عشر من ذكور الارانب , قسمت الى ثلاث مجاميع متساوية , جرعت مجموعة السيطرة ب ٣ مل من المحلول الملحي الفسيولوجي , بينما جرعت المجموعة الثانية ب ٥ مل / كغم من وزن الجسم بمستخلص حبوب اللقاح والمجموعة الثالثة ب ٢٥ مل / كغم من وزن الجسم . ظهرت زيادة ملحوظة في معدل الخلايا النطفية وانخفاض في معدل الخلايا الميتة في الحيوانات المعاملو بالمستخلص , كما ظهر ارتفاع في عملية حوؤل النطف في النبيبات المنوية من خلال زيادة الخلايا النطفية الاولية والثانوية مقارنة بحيوانات التجربة.