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Semen Quality and Fertilizing Ability of Sinai Cocks Fed Bee Bread as a Natural Supplement to the Diet

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ABSTRACT

All number of 75 Sinai cocks, 24- wks- old were, divided into five experimental groups to investigate the effect of adding bee bread (BB) as growth promoter and antioxidant materials to the diet at different levels (0.0 , 0.5 , 1.00 and 1.50 g / kg diet) as well as a group supplemented with 250 mg ascorbic acid/kg as a positive control (PC) on semen quality, fertilizing ability and hatchability as well as some physiological measurements through the experimental period (24-40 wk of age). The results indicated that, adding or the different levels of BB or had a significant improve in sperm concentration,and percentage of motility, and decrease of abnormal sperm percentage in semen. Seminal plasma was not significantly influenced, whereas LDL. cholesterol significantly lowered by adding 1.0 g BB/kg diet comparing with the basal diet. Fertility percentage was significantly increased for the group fed 1.0 g BB/kg diet than the control group. Early embryonic mortality , late embryonic mortality and total embryonic mortality values were significantly lower for the groups fed BB diets as comparing with those fed the basal diet. White blood cells counts was insignificantly improved for cocks fed BB diets as comparing with those fed the basal diet. The studied serum constituents (T. protein , albumin &globulin) for cocks fed BB diets were insignificantly affected except for A/G ratio.. It is concluded that BB adding to diets could improve the reproductive performance of Sinai cocks.

Keywords: Bee bread, Sinai cocks, semen quality, fertilizing ability.

INTRODUCTION

Nearly BB contains 25 elements either macro such as fe,ca,p,k, co, or micro for example,se &zn. the enzymatic hydrolysates prepared from BB using two gastrointestinal proteases & protein proteases .This enzymatic hydrolysates contained high amounts of proteins and compounds of phenolic. BB have antioxidant activity by scavenging reaction oxygen species (Marchini *et al*., 2006). (Marchini *et al*., 2006) reported that Antioxidants are compounds used in foods to aginist deterioration, rancidity, or discoloration caused by oxidation. Thus , the structure of the Bee bread differs slightly from that of pollen. The acidity of BB is high, this result from presence lactic acid and large level of vitamin K. The amount of lactic acid in Bee bread by about six times.According to Takeshi *et al*., (2005), inhibit the growing molds as well as microorganisms have a good preservation.In fact, artificial insemination (A.I) leading decrease the cost of natural insemination where it result in reducing the cost by decreasing the number of cocks needed (Benoff *et al*., 1981).Improving poultry performance fed bee pollen diets perhaps due to its a phytogenic properties such as; antimicrobial (Guo *et al*., 2004a), antioxidant (Hashemi *et al*., 2009a), anti-stress (Chattopadhyay *et al*., 2005), gut microflora manipulation (Hashemi *et al*., 2009b), nutrigenomics effect (Franco-Jimenez *et al*., 2007). Wang *et al.* (2002) showed that supplementing bee pollen (1-1.5%) significantly increased sperm quality, activity and density spermThe addition of bee pollen to the diet can decrease heat stress and rise the reproductive and endocrine capacity of breeder cocks in summer. Vitamin C was prosedure used in poultry diets, because of its anti-stress effects and also because of its synthesis was reduced through heat stress (Richards, 1997 , Kafri *et al*., 1984) . In the same way under heat stress condition, birds are not able to synthesize sufficient amount of vitamin C (David and Brake, 1985) observed that ascorbic acid supplementation in broiler diet reduced mortality by 14.6% during heat stress.Therefore, the target of this study was to determine the effect of supplementing bee bread to local Sinai cocks diet on semen quality, fertilizing ability and hatchability as well as some physiological measurements during experimental period from 24 to 40 wks of age during summer condition.

MATERIALS AND METHODS

This study was used out at El – Serw Research farm-Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt. A total bird of 75 Sinai cocks, 24-wk old, were taken and randomly division into five experimental groups of three replicates (5 cocks each) . All cocks were reared under same hygienic and managerial conditions. Throughout the experimental period, feed and fresh water were available all the time. The basal diet was formulated according the recommendation of nutrient requirements for Sinai and then supplemented with very few levels of bee bread (0.0, 0.5, 1.00 and 1.50 g / kg diet), whereas the fifth group was kept as a 250mg/ kg ascorbic acid (positive control group). The composition with calculated analysis of the basal diet are shown in table (1).

Table 1. Composition and calculated analysis of the basal diet.

Ingredient	%
Yellow corn	67.60
Soy bean meal (44 %)	23.25
Di-calcium phosphate	1.70
Limestone	6.70
Vit & Min. premix [1]	0.30
NaCl	0.35
DL- Methionine (99%)	0.10
Total	100
Calculated Analysis [2]	
Crude protein %	16.08
ME (Kcal / kg)	2750
Crude fiber %	3.11
Ca. %	3.00
Av. Phosph.%	0.43
Lysine (%)	0.80
Methionine (%)	0.36
Meth. + Cyst. (%)	0.63
Na %	0.16

1- Each 3kg of Vit .and Min. premix contains 100 million IUVit A;2 million IU Vit.D3;10 g Vit.E; 1 g Vit.K_3 ; 1 g Vit B1; 5 g Vit B2 ;10 mg Vit.B12 ; 1.5 g Vit B6; 30 g Niacin ;10 g Pantothenic acid ;1g Folic acid;50 mg Biotin ; 300 g Choline chloride; 50 g Zinc; 4 g Copper; 0.3 g Iodine ; 30 g Iron; 0.1 g Selenium; 60g Manganese ;0.1 g Cobalt; and carrier $CaCO_3$ to 3000 g .

2- According to NRC (1994). 3- Price of one kg (LE) at time of experiment for different ingredients : yellow corn ,2.50 ; Soy been meal, 3.80 ; Di-calcium,8.0 ; limestone, 0.10 ; Vit&Min.,20.0 ; Nacl,0.50 and Meth.,45.0.

Data analysis and parameter estimated.

1- Semen pooled and calculated of semen quality traits:

Cocks were used from each treatment on the basis of a positive reaction in dorsoabdominal stimulation for artificial collection of semen in the morning. Within ten min after collection, sperm motility (mass and advanced) , ejaculate volume &sperm concentration were determined for each cock. Semen smears were done to study the morphology of spermatozoa after nigrosin & eosin staining of (Bakst and Cecil, 1997) and dead sperm and total abnormalities percentages were recorded.

2- Constituents of Seminal plasma:

Freshly collected semen samples fifth treatment were taken, centrifuged at 3500-4000 rpm for ten min to collect the seminal plasma. Samples of seminal plasma were preserved at −20°C until used for the determination of total protein, albumin- triglycerides- total cholesterol- High-Density Lipoprotein (H.D.L) and Low Density Lipoproteins (L.D.L) cholesterol .

3- Fertilizing ability test:

One hundred and fifty of Sinai hens (at the same age of cocks) were divided into five groups of three replicates. Freshly semen was pooled for cocks from each experimental group for artificial insemination process. Sinai hens in different experimental groups were starved for 15 h before (A.I) artificial insemination prosedure. Hens were inseminated used three times through the first week of artificial insemination period, then every three days for three weeks, at ten am using 0.05 ml raw semen / hen from their respective cocks during 30 min of collection time. Hatching eggs were collected after the second week of artificial insemination up to the end of experimental period and incubated to evaluate fertility and hatchability percentages. The eggs were put in an automatical incubator and incubated at 37.5°C & 65% relative humidity. Fertility was observed by candling eggs on the 7th day of incubation, then hatchability and embryonic mortality percentage of fertile eggs was calculated at the last of incubation period.

4- Slaughter trail:

At the finish of experimental period, three cocks from each replicate were used randomly selected and slaughtered. Data of some organs were calculated as a percentage of live weight.

5- Hematological parameters:

at the last of the experimental period (40 wks of age), blood samples taken randomly selected from three cocks per treatment were collected in vial tubes containing edta as anticoagulant A total white blood cell was determined by the report method (Campbell, 1995). Gross and Siegel, (1986) cleared that Leucocyte cells heterophils (H), lymphocytes (L), eosinophils, and basophils) were counted in different microscopic area in a total of 200 WBC by the same person, and the heterophils & lymphocytes ratios were calculated .

6 - Constituents of Blood:

During the time of slaughter, blood samples from each chicken were collected without anticoagulant and stored at room temperature for one hour to clot. Tubes contain sample were centrifuged at 3000 rpm for 15 minutes to separate clear serum and determine concentration serum globulin and total protein (Peters, 1968), total cholesterol (Ellefson and Caraway, 1976). (Bucolo and David, 1973) triglycerides, (Siedel, 1983) HDL and LDL . These biochemical determinations of blood serum were performed colorimetrically using commercial kits.

7-Histological study:

Specimens of testes were taken from birds immediately after sacrificing. Tissue specimens were fixed in 10% neural buffered formalin solution, and then sectioned of 7µm. Thick paraffin sections were cut and slides from each specimen were stained with Haematoxylin and Eosin stain, for studying the general histological structure (Drury and Wallington, 1980).

8 -Statistical analysis of variance:

Data were analyzed by the analysis of variance by SAS (2004) and significant differences among means were detected by the Duncan's Multiple Range Test (Duncan, 1955).The following model was used:

$$Yij = \mu + Ti + eiJ$$

where,

µ = overall mean ,
Yij = An observation ,
Ti = Effect of treatment (1, 2 , … , 4) and eiJ = Random error.

RESULTS AND DISCUSSION

Results of Table 2 observed some physical parameters of semen quality of Sinai cocks live and dead sperm and Ejaculate volume percentages were significantly (P≤0.05) increased by feeding diet adding with different level of BB/kg diet as compared to those fed the control diet. Feeding BB to Sinai cocks resulted in a significant improvement in sperm concentration, sperm motility, whereas, it had a significant lowered in abnormal sperms percentage as compared to the control. Biochemical parameter of seminal plasma for Sinai cocks showed protein, albumin , globulin , A/G ratio, triglycerides, total cholesterol and HDL cholesterol concentrations were insignificantly increased by feeding diet adding with different BB supplemental grade as compared to those fed the control diet , whereas LDL cholesterol level significantly (P≤0.05) decreased as compared the control diet. Sinai cocks fed diet supplemented with 0.5 and 1.5 g BB/kg had significantly (P ≤0.05) increased and those fed 1 g BB higher sperm concentration by 5.1 and 25.9% as comparing with to those fed the positive basal diet. Also the diet supplemented with 1.5 g BB/ kg had significantly higher motility by 19.8% and as lower abnormal sperm by 33% . Sinai cocks fed diet adding with 0.5, 1.00 and 1.50 BB/kg had insignificantly lower LDL cholesterol by 12.4, 21.9 and 15.9%, respectively, as compared to the control group. Basim et,al., 2006 and Fatrcová Šramková *et al* (2013) reported The in-vitro antibacterial activities of pollen extracts were contained against 13 different species of agricultural bacterial pathogens , diluted rabbit semen to control bacterial growth and to protect spermatozoa from detrimental effects of bacteria and their toxins. Manal K. Abou El-Naga (2014) observed that semen quality (volume, concentration and livabilit), both dietary levels of pollen

significantly lowered serum content of glucose and total lipids and improve gonadotrophic hormone (FSH, LH) and testosterone in and hatchability in Norfa laying hens were significantly (P = 0.05) improved by pollen addding. This improvement in reproductive traits may be due to BB rich in antioxidants such as flavonoids and carotenoids which act as a defense against peroxidative destroy and hence essential to maintain the structural integrity of the spermatozoa (Surai *et al*., 1997). .Liu (2009) reported that semen quality traits were significantly improved of cocks fed bee pollen at 50 wks of age.

Table 2. Effect of dietary bee bread supplementation on semen quality traits and simenal plasma constituents of Sinai cocks .

Parameter	Bee bread, g/kg				
	0.0	P.C	0.5	1.0	1.5
Ejaculate volume (ml)	0.36±0.04^{ab}	.29±0.05^{b}	0.41±0.12^{ab}	0.60±0.08^{a}	0.38±0.03^{ab}
Sperm concentration ($\times10^6$/mm^3)	1.95±0.04^{c}	2.7±0.08^{b}	2.84±0.14^{b}	1.97±0.07^{c}	3.4±0.08^{a}
Sperm motility, %	68.33±1.7^{ab}	64±1.02^{bc}	63.33±1.7^{bc}	56.70±1.7^{c}	76.67±0.67^{a}
Live sperme (%)	86.7±1.7	80±2.8	84.00±2.1	88.30±1.76	88.33±3.30
Abnormal sperme (%)	18.33±0.9^{b}	21±0.57^{a}	16.00±0.57^{cd}	17.00±0.57^{bc}	14.00±0.57^{d}
Total proteins (g/ dl)	2.23±0.07	2.11±0.16	2.05±0.22	2.04±0.11	2.27±0.03
Albumin (g/ dl)	1.03±0.06	0.95±0.04	0.93±0.13	0.93±0.60	1.03±0.03
Globulin (g/ dl)	1.20±0.06	1.16±0.12	1.12±0.09	1.11±0.05	1.24±0.08
A/G ratio	0.80±0.03	0.85±0.06	0.82±.05	0.85±0.03	0.85±0.03
Triglycerides (mg/ dl)	27.0±0.34	23.60±.67	27.5±2.06	28.6±0.45	25.1±0.22
Total cholest. (mg/ dl)	25.5±1.00	25.40±1.3	26.2±1.52	23.8±0.53	25.6±0.42
HDL cholest. (mg/ dl)	3.50±0.40	3.50±0.19	4.50±0.22	4.10±0.11	4.15±0.31
LDL cholest. (mg/ dl)	9.25±0.20^{a}	8.45±0.4^{ab}	7.40±0.67^{ab}	6.60±0.11^{b}	7.1±0.30^{ab}

a,b,c,d:means in the same row bearing different superscripts are significantly different (P≤0.05).

Table 3 showed the effect of BB adding levels on hatchability traits and fertility traits. Hatchability of fertile eggs was significantly (P ≤0.05) improved by adding 1.50 g BB/kg diet compared to other treatments. Early embryonic mortality (EEM) and late embryonic mortality (LEM) significantly lowered by adding 1.50 g BB/kg diet comparing with the other treatments . Fertility percentage was significant improved by 16.4, 28.2 and 20.1% for the groups fed 0.5, 1.00 and 1.50 g BB/kg diet, respectively as compared to those fed the basal diet. Hatchability of set eggs significantly improved by 10.8, 24.3 and 41.6 g BB/kg diet respectively than those fed the control diet. Hatchability of fertile eggs significantly improved by adding 1.50 g BB/kg diet compared to the control. Early embryonic mortality significantly decreased by adding 1.5 BB/kg diet compared to the control. Total embryonic mortality significantly lowered by adding 0.5 and 1.50 g BB/kg by 14.9 and 41.5% as compared to those fed the control diet. These results perhaps due to bee pollen exhibit antifungal, antibacterial activity, anti-inflammatory, and/or an antimicrobial agent and improved the immune system (García *et al*., 2001) Manal K. Abou El- Naga (2014) observed higher hatcability percent in groups fed 1 or 2% pollen than to the control group . This result is the same opinion with those obtained by Awad *et al* (2013) who cleared that fertility and hatchability were increased due to feeding diet supplemented with BB during laying period.

Table 3. Effect of dietary bee bread supplementation on fertility and atchability traits of local Sinai strain under summer condition.

Parameters	PC	Bee bread,(g/kg)			
		0.0	0.5	1.0	1.5
Fertility (%)	94.6±0.55^{a}	78.0±0.63^{d}	90.8±0.55^{c}	92.3±0.00^{b}	93.7±0.63^{b}
Hatchability of set eggs (%)	78.56±0.38^{b}	57.43±0.38^{e}	63.6±0.63^{d}	71.4±0.63^{c}	81.3±0.63^{a}
Hatchability of fertile eggs (%)	83.3±0.63^{b}	72.7±0.63^{c}	70.0±0.57^{d}	71.4±0.63^{cd}	86.7±0.63^{a}
EEM	5.30±0.63^{c}	7.14±0.58^{c}	18.2±0.63^{a}	14.2±0.64^{b}	6.30±0.64^{c}
LEM	10.50±0.64^{b}	14.33±0.66^{a}	9.43±0.48^{b}	14.2±0.64^{a}	6.30±0.58^{c}
Total EM	15.7±0.63^{d}	21.40±0.64^{b}	27.63±0.63^{c}	28.4±0.64^{a}	12.50±0.63^{e}
Chick wt. (g)	34.43±0.66^{b}	38.2±0.64^{a}	39.6±0.64^{a}	38.0±0.58^{a}	35.5±0.64^{b}

PC = positive control (250 mg ascorbic acid /kg diet). EEM& LEM = early and late embryonic mortality
a,b,c,d,e :means in the same row bearing different superscripts are significantly different (p ≤ 0.05).

Results in table (4) showed the effect of BB supplementation to the diet on relative weights of some organs of Sinai cocks fed 1.0 g BB/kg diets had insignificantly higher liver percentage than the control group, while cocks fed diet supplemented with 0.5 had insignificantly higher testes percentage by 6.7% as comparing with to those fed the control diet. Moreover, cocks fed diet adding with 1.00 and 1.50 g BB/kg had insignificantly higher spleen percentage by 18.2 and 27.3% as compared ing with those fed the basal diet, respectively.

Table 4. Effect of dietary bee bread supplementation to Sinai cocks diets on as relative body weight of some interval organs 40 wks of ages.

Parameters	PC	Bee bread , g/kg			
		0.0	0.5	1.0	1.5
Liver %	1.25±0.04[b]	1.04±0.05	0.89±0.12	1.40±0.14	1.22±0.03
Gizzard %	1.22±0.08	1.08±0.11	1.13±0.02	1.15±0.18	1.02±0.12
Heart %	0.66±0.01	0.58±0.03	0.65±0.06	0.74±0.04	0.72±0.01
Testes %	2.04±0.19	1.93±0.22	2.06±0.11	1.82±0.09	1.66±0.31
Spleen %	0.14±0.01	0.11±0.01	0.12±0.03	0.18±0.03	0.16±0.01
Pancreas %	0.13±0.02	0.11±0.01	0.09±0.01	0.13±0.02	0.14±0.03

Concerning the effect of BB on blood hematology, results of table (5) showed that white blood cells counts (WBC) , heterophils (H) and lymphocytes (L) % and their ratio (H/L) were not significantly affected by treatments. Cocks fed diet adding with 0.5 and 1.00 g BB/kg had insignificantly higher (H/L ratio) by 12, 16% as comparing with those fed the control diet. The effect of BB supplementation to Sinai cocks diet on serum total protein, globulin (G), albumin (A),were insignificantly affected by all supplementing levels, however, A/G ratio was significantly affected . Sinai cocks fed diet supplemented with 1.0 and 1.5 g BB/kg had significantly lower A/G ratio by 14.30 and 4.76% , respectively, as comparing with those fed the positive control diet. Sinai cocks fed diet supplemented with 1.0 g BB/kg had insignificantly lower total cholesterol by 4.2% than those fed the control diet . Sinai cocks fed diet adding with 0.5 and 1.50 g BB/ kg had insignificantly high-denisty-lipoprotein cholesterol by 28.4 and 19.7 %, respectively as , compared to those fed the control diet.These results are in partial agreement with the result of galal *et al*, (2008), who observed that high level of dietary propolis significantly increased hematocrit level, plasma total protein and globulin. Gross and Siegel. (1985) showed that there was no significant difference between control and low level of propolis adding for both heterophils and lymphocytes count. Also supplementation of propolis at 100 or 150 mg is beneficial for improving the performance and immunity. The adding propolis at 100 and 150 mg significantly reduced plasma cholesterol compared to control group. Galal *et al*. (2008) cleared that 100 and 150 mg propolis adding significantly lowered heterophils (H) count and improved lymphocytes (L) count when compared with the control-group. Battaa *et al*. (2014) reported that increasing globulin concentration with increased BP inclusion may be an indication of increased immunity in the rabbits since the liver will be able to synthesize enough globulins for immunologic action. Wang *et al*. (2006) observed that diet supplemented with 1.5% BP could improve the tissues structure of digestive organ, and then the digestion and absorption. The decrease of cholesterol levels may be directly related to the influence of BP on lipid metabolism (Hajkova *et al*., 2013).

Table 5. Effect of bee bread supplementation to Sinai cocks diets on hematology and same blood serum constituents.

Parameters	PC	Bee bread, g/kg			
		0.0	0.5	1.0	1.5
Hematological traits :					
WBC ($x10^3/mm^3$)	22±1.2	25±1.0	24±2.0	24±1.2	20±0.67
Eosinophils %	0.30±0.33	0.20±0.21	1.0±0.05	0.2±0.05	0.30±0.33
Basophils %	0.60±0.33	0.50±0.4	0.5±0.5	0.6±0.33	0.6±0.33
Heterophils % (H)	20.8±0.7	19.3±0.45	22±0.3	22.5±1.8	20.66±0.7
Lymphocyte% (L)	78.3±0.7	80±0.42	76.5±0.5	76.7±2.0	78.44±0.9
H / L	0.26±1.09	0.25±0.14	0.28.75±0.15	0.29 ±3.06	0.26±1.11
Serum constituents :					
T. protein (g/dl)	3.98±0.23	4.42±0.23	4.14±0.16	4.07±0.3	4.55±0.1
Albumin (A) (g/dl)	2.22±0.04	2.28±0.13	2.06±0.2	1.95±0.2	2.3±0.04
Globulin (G) (g/dl)	1.77±.08	2.14±0.09	2.08±0.01	2.11±0.2	2.25±0.06
A/G	1.25±0.05[a]	1.05±0.05[b]	1.0±0.1[b]	0.90±0.04[b]	1.0±0.04[b]
Triglycerides (mg/dl)	90.88±1.07	83.6±4.07	90.16±10.4	93.1±2.6	85.10±3.14
T. cholest (mg/dl)	118.4±8.13	110.6±8.02	117.1±18.9	106.02±2.8	112.75±7.9
HDL (mg/dl)	15.3±2.77	14.95±0.9	19.2±2.42	17.65±0.35	17.9±1.3

PC = positive control (250 mg ascorbic acid /kg diet) WBC= white blood cell
a,b :means in the same row bearing different superscripts are significantly different ($p \leq .05$). H / L= Heterophils % / Lymphocyte%.

Histological observation:

Histological examination of rabbit testes table (6) revealed oval testicular shape of seminiferous tubules (ST) in testes of rabbits treated with ascorbic acid with control-possitve control (PC) , (T1& plate3) and those treated with 1.5 g/kg BB (T4 & plates 7and 8) , circular in T2 (Plates 4,5) treated with 0.5 g/kg BB and T3 (plate 6) trated with 1g/kg BB and irregular shape in control group. On the other hand, ST showed larger size in T1(plate3) and T4 (plates 7and 8) , moderate size in T2 and T3 than in control (plates1and 2) .

Table 6. Effect of bee bread supplementation on histometry of cock testis.

Parameters	Bee bread, g/kg				
	0.0	P.C (T1)	0.5 (T2)	1.0 (T3)	1.5 (T4)
Thickness of spermatogenic layer	+	++	+	++	+++
Lumen of ST	++	++	+	+	+++
Denisty of ST	+	++	+	+	+++
Shape of ST	irregular	Oval	circular	circular	oval
Size of ST	small	large	medium	medium	large

ST = Seminiferous tubules

It is of interest to observe that lumen of ST was the widest in T4 (plates 7 and 8), moderate in control (plates1and 2) and T1 (plate3), the narrowest in T2 (Plates 4 and 5) and T3 (plate 6).

Thickness of spermatogenic layer of ST markedly increased only in T1(plate 3), T3 (plate 6) and T4 (plates 7 and 8) , being the highest in T4 (plates 7,8), while T2 (Plates 4and 5) did not differ from that in control (T1).

Concerning the density of ST, the histological examination cleared that only T4 (plates 7 and 8) and T1 (plate 3) showed higher ST density than in control (T1) , while ST density of T2 and T3 were not affected by treatment.

Based on the foregoing investigation, treatment of rabbits with 1.5 g/kg BB resulted in the best results in terms of increasing size of ST with regular oval shape and the highest spermatogenic layer thickness, the widest lumen, and density of ST, reflecting a benifical effect of bee bread on histogenesis and histometry of the testicles in cock.

On the other hand T1 (plate 3) treated with ascorbic acid (PC) and those treated with 1 g/kg BB (T3), followed cocks in (T4).

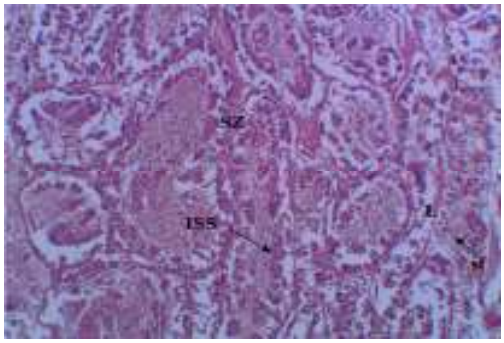

Plate 1. section in testis of control cock (H&Ex100).
ST = Seminiferous tubules , L == Lumen of Seminiferous tubules.
ISS = Interstitial stroma, SZ = Spermatozoa

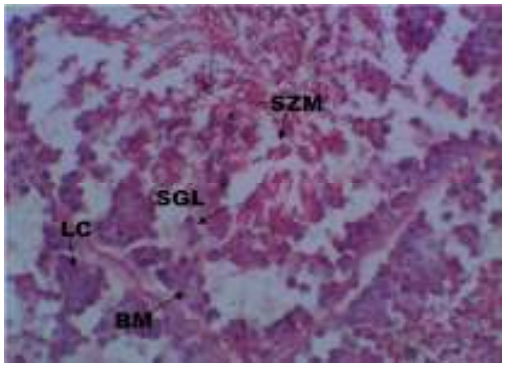

Plate 2. section in testis of control cock (H&Ex400)
BM = Basement membrane, LC == Leydig cells
SZM = Spermatozoa, SGL = Spermatogenic layer

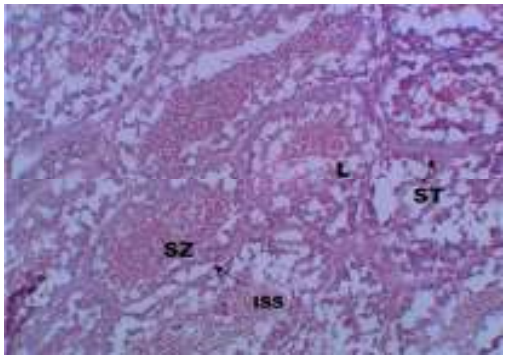

Plate 3. section in the testis from the cock fed (ascorbic acid) pc H&Ex100).
ST = Seminiferous tubules , L == Lumen of Seminiferous tubules.
ISS = Interstitial stroma , SZ = Spermatozoa

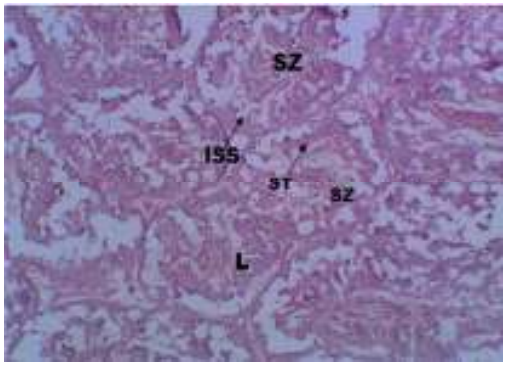

Plate 4. section in the testis fed bee bread (0.5 gm/kg diet). Fed group (H&EX100).
ST = Seminiferous tubules, L == Lumen of Seminiferous tubules.
ISS = Interstitial stroma, SZ = Spermatozoa

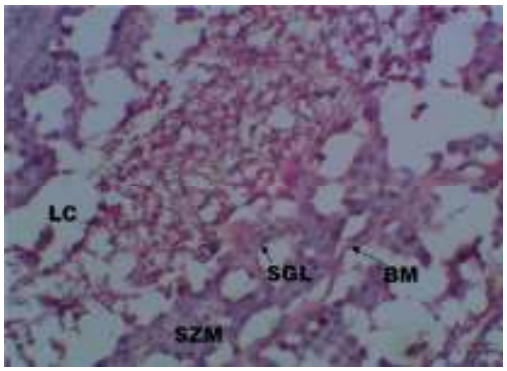

Plate 5. section in the testis fed bee bread (0.5 gm /kg diet) (H&Ex400).
BM = Basement membrane, LC == Leydig cells
SZM = Spermatozoa , SGL = Spermatogenic layer

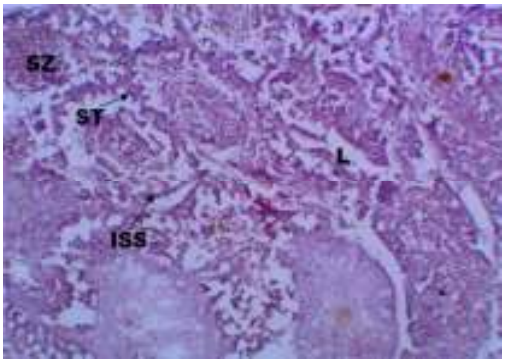

Plate 6. ection in testis fed bee bread (1.0 gm/ kg diet) fed group (H&Ex100)
ST = Seminiferous tubules , L = Lumen of Seminiferous tubules.
ISS = Interstitial stroma , SZ = Spermatozoa.

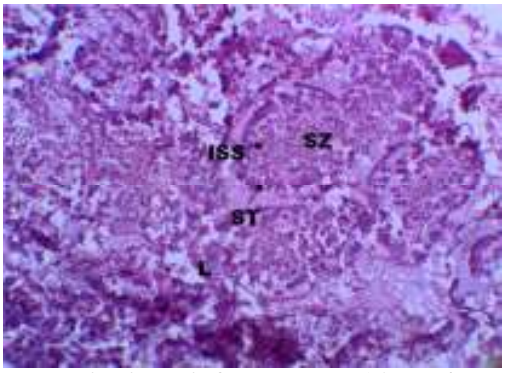

Plate 7. section in testis fed bee bread (1.5 gm/ kg diet) (H&Ex100).
ST = Seminiferous tubules , L = Lumen of Seminiferous tubules.
ISS = Interstitial stroma , SZ = Spermatozoa

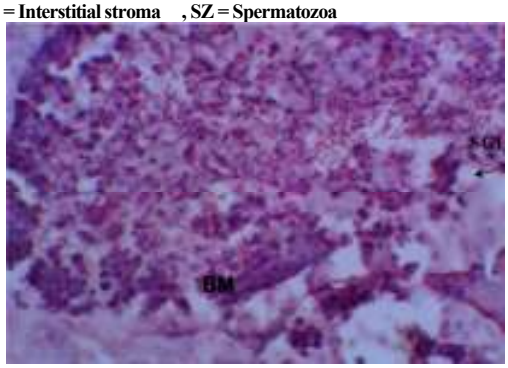

Plate 8. section in testis fed bee bread (1.5 gm/ kg diet) fed group (H&EX400).
M = Basement membrane, SZM = Spermatozoa ,
SGL = Spermatogenic layer.

CONCLUSION

Based on the present data, it is concluded that bee bread supplementation up to 1.5 g/kg to cock diet had positive effects on semen quality , fertilizing ability and hatchability traits of Sanai cocks under Egyptian summer conditions.

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جوده السائل المنوي و القدره الاخصابيه للديوك السيناوي المحليه و المغذاه علي خبز النحل كأحدي الأضافات الطبيعيه.

هاني نبيل فهيم

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أجري هذا البحث لدراسه أستخدام مستويات مختلفه (صفر, ٠.٥ , ١ , ١.٥ جم /كجم عليقه) من خبز النحل و ٢٥٠ ملجم فيتامين ج /كجم عليقه (مجموعه مقارنه موجبه) لعلائق الديوك السيناوي . تم أستخدام ٧٥ من ذكور السيناعلي عمر ٢٤ أسبوع وتم وزنها و قسمت الي خمسه مجاميع تجريبيه لدراسه خصائص جوده السائل المنوي و الخصوبه و التفريخ للبيض بعد أخصابه مع قياس بعض الصفات الفسيولوجيه خلال فتره التجربه بين (٢٤- ٤٠ أسبوع من العمر). و توضح النتائج مايلي:-اضافه خبز النحل للعلائق ادي الي زياده معنويه في تركيز الاسبرمات و الحركه الجماعيه مع انخفاض في نسبه الاسبرمات الشاذه في ديوك السيناوي المحليه.لم يكن هناك تأثير معنوي واضح لمكونات البلازما المنويه عدا قياسالبروتينات الدهنيه منخفضه الكثافه ولوحظ ان الكوليسترول قل مستواه بصوره معنويه بأستخدام مستوي ١ جم/ كجم عليقه). مقارنه بالكونترول.ظهور تحسن معنوي للخصوبه للمجموعه المعامله بمستوي ١جرا م/ كجم عليقه مقارنه بالكونترول.انخفاض معنوي واضح للنفوق المبكر و المتأخر للأجنه و كذلك النفوق الكلي للأجنه عند أستخدام جرعات خبز النحل للعلائق مقارنه بالكونترول.تحسن غير معنوي لعدد كرات الدم البيضاء عند استخدام جرعات خبز النحل في العلائق مقارنه بالكنترول.لم يكن هناك فروق معنويه لمكونات الدم للمجاميع المعامله بخبز النحل عدا نسبه الالبيومين/ الجلوبيولين .و خلصت الدراسه الي ان اضافه جرعات بمستويات مختلفه من خبز النحل الي علائق ديوك السيناوي أدت لتحسين النواحي التناسليه بشكل واضح.