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Effect of Date Seeds Powder on some Biochemical Parameters and Female Sex Hormones of Quail Female

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ABSTRACT

The current study was designed to know the effect of dates seeds powder in different concentrations on the levels of glucose, female sex hormones and the total capacity of antioxidants of the female quail eight weeks post treatment. Thirty of local females Quail *Coturnix coturnix* aged (55-65) days and weight (300-350) g, were randomly divided into five groups six within each, the first group: control group animals were given empty capsules, the 2nd, 3rd, 4th and 5th groups: animals were given capsules contained powder of dates seeds at concentration of 250, 500, 1000 and 2000 mg / kg body weight, respectively for eight weeks.

The results show significant decrease in the concentration of glucose at 5th group compared with the control group, at ($P \leq 0.05$). While there was significant increase in the level of female sex hormone (FSH), (LH) and estrogen hormone along the periods of treatment in all groups as compared with the control group at ($P \leq 0.05$). This was accompanied by an increase of antioxidants total capacity at all treatment groups compared with the control group especially at 5th group.

Keywords: Quail bird, female sex hormones, glucose, antioxidants, date seeds powder.

تأثير مسحوق نوى التمر على بعض المعايير الكيموحيوية والهرمونات الجنسية الأنثوية لإناث طائر السمّان

الملخص

صممت الدراسة الحالية لمعرفة تأثير مسحوق نوى التمر بتراكيز مختلفة على مستوى الكلوكوز والهرمونات الجنسية الانثوية والسعة الكلية لمضادات الاكسدة لإناث طائر السمان. بعد ثمانية اسابيع من المعاملة، ثلاثون من اناث طيور السمان تراوحت اعمارها بين (55–60) يوم وأوزانها (300–350) غم. قسمت عشوائيا إلى خمس مجاميع كل مجموعة ضمت6 طيور وهي كالاتي: المجموعة الاولى: مجموعة سيطرة، اعطيت كبسولات فارغة، اما المجاميع الثانية والثالثة والرابعة والخامسة تم إعطاؤها كبسولات احتوت على مسحوق نوى التمر بتراكيز 250، 500، 1000، 2000 ملغم/كغم وزن جسم على التوالي ولمدة 8 اسابيع.

اظهرت نتائج الدراسة حدوث انخفاض معنوي في مستوى الكلوكوز للمجموعة الخامسة مقارنة مع مجموعة السيطرة عند مستوى احتمال ($P \leq 0.05$). بالإضافة إلى ارتفاع في تركيز الهرمونات الجنسية الانثوية (L.H)، (F.S.H.) وكذلك هرمون الاستروجين رافقه زيادة في تركيز السعة الكلية لمضادات الاكسدة في كل المجاميع المعاملة مقارنة مع مجموعة السيطرة ولا سيما المجموعة الخامسة.

الكلمات الدالة: طائر السمان، هرمونات جنسية انثوية، كلوكوز، مضادات الاكسدة، مسحوق نوى التمر.

INTRODUCTION

Palm tree is one of the important crops in arid and semi- arid areas, and play an important role in the social and economic life in these areas, which is distributed in many countries around the world such as Iraq, Saudi Arabia, Iran and Many other countries (FAO. 2010). Arab philosophers in their books and their authors wrote about it in their books. Palm tree will remain along with the

camel as symbols of the Arabs in every time and place. The palm belong to monocot plants characterized by beautiful appearance, whether on the form of trees or shrubbery, dates palm back to the platoon berry Palmaceae and to genus *Phoenix*, known *dactylifera*. The most important areas for dates palm to grow in the world are found in Iraq because of their economic importance and substantial food. The medical benefits are not confined to the dates, but extends to the dates seeds also, which used to treat diabetes and hardening of the arteries and lithotripsy and weight gain (Al-Shanti *et al*., 2013). Besides date's seeds oil can be used in many industries, such as manufacture of soap and also used as a source of good dietary fibers that include cellulose, hemi cellulose, pectin, lignin, which reduces sugar level and fat, as well as reduce constipation and help gastric emptying (Mohammad and Al- Najafi, 2011).

Chemical Components of the Dates Seeds

Dates seeds contains dietary fibers 2.8%, 3.8% proteins, nitrogen, calcium, phosphorus, iron, magnesium, selenium extract and fat, B vitamins group, especially B_7 and Vitamins A, E, K and many of fatty acids, including: Oleic acid, Linoleic acid, Palmitoleic, Arachidic, Linolenic, Stearic, Myristic acid, Pentadecanoic (Nehdi *et al*., 2010).

Iraq is at the forefront of producing of dates after Egypt and Saudi Arabia, Iran, United Arab Emirates (F.A.O., 2007). And the weight rate of dates seed to the dates fruit ranging from 6.16% - 11.47% (Habib and Ibrahim, 2008).

MATERIALS AND METHODS

Date Seeds

The seeds of Alkhstawi dates that are used in this study had been optained from local markets cleaned washed and then dried after that. The date seeds were minced then placed into capsules according to its treatment dose (Cheij, 1984).

Animals Used

Thirty of local females Quail *Coturnix coturnix* aged between (55-65) and weights ranged between (300-350) g (Kettani, 1980), were placed in cages made from wood which were intended for this purpose, and under the appropriate conditions of temperature ranged between (25- 28)°c and lighted about 15 hours light –9 hour darkness the birds were subjected to the introductory period extending for a week for adaptation to the place and the food, free water provided to the birds.

The Ration Used in the Study

The birds fed on a special ration of bird feeding, it was equipped basic components of the ration and protein content and energy according to the National Research Council (National Research council, 1994), as in the following Table (1).

Table 1: Basic components ration of the ration used in the study

Food material	Bush %
Crushed yellow corn	57
SBM (44% protein)	33.5
soy bean	2
protein center	6
Limestone	0.5
Vitamins and minerals	1
Total	%100
Metabolic energy (Kalusarh / kg feed)	2642
The proportion of energy / protein	133.73
Percentage of crude protein	22.0

The Experiment Design

After the introductory period ends, the birds were divided into five groups, randomly and by six birds/ group.

1- The first group considered as a control group: included as six birds with initial weight 325 g, the birds were given a standard ration and regular water and were given empty capsules to offset the birds caught stress (Batchelor and Giddins, 1995).

2- The second group: included six birds with initial weight 330 g, birds were given dates seeds powder capsules of 250 mg / kg B.W in addition to the standard ration and water.

3- The third group: included six birds with initial weight 351 g, given dates seeds powder capsules of 500mg / kg B.W in addition to the standard ration and water.

4- The fourth group: included six birds with initial average weight 302 g, birds were given seeds powder capsules 1000 mg / kg B.W in addition to the standard ration and water.

5- The fifth group: included six birds with initial average weight 330g, birds were given date seeds powder capsules of 2000 mg/ kg B.W in addition to the standard ration and water.

Biochemical Tests

1- Glucose Concentration in the Blood Serum

2- Hormonal Tests

3- Concentration of the Antioxidants Total Capacity in the Blood Serum.

Statistical Analysis

Results were statistically analyzed according to the simple process experiments system full random design, and use Duncans multiple range test to find differences between the groups and the results consider significant at the probability level ($P \leq 0.05$), using the statistical program SAS and Covariance test for the extraction of LSD (Antar, 2010).

RESULTS AND DISCUSSION

Fig. (1) shows a significant decrease ($p \leq 0.05$) in blood glucose concentration with different concentrations of dates seeds powder treatments compared with the control group except birds group 2 which show no significant differences compared the control group the decline in glucose concentration appear more significantly with group 2000 mg/ kg of treatment.

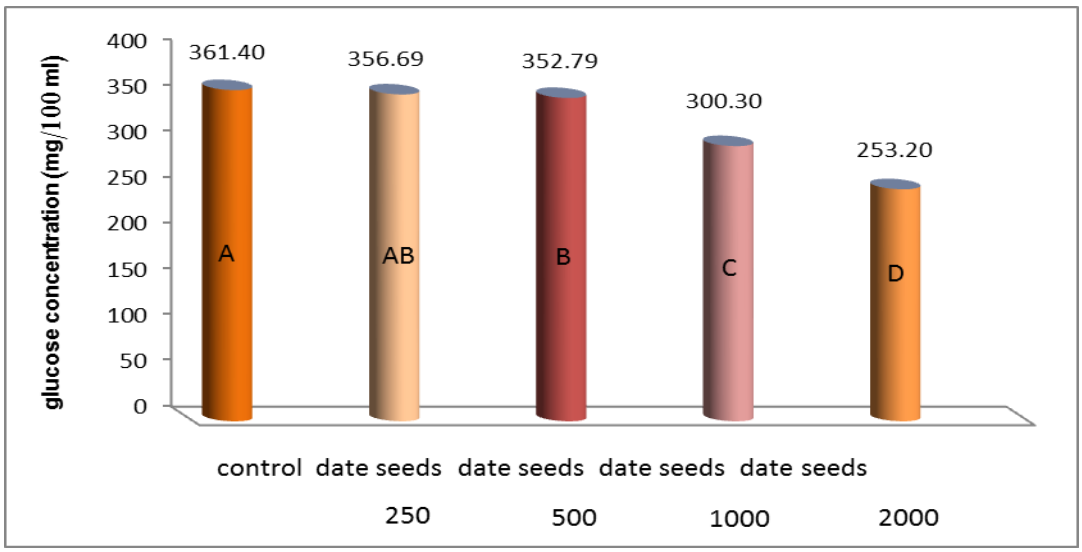

Fig. 1: The effect of date seeds powder treatment in different concentrations (250, 500, 1000, 2000) mg /kg body weight on glucose concentration

The values expressed in the arithmetic average (±) standard deviation and the number of birds/group = 6. different letters indicate a significant differences at the level ($p \leq 0.05$).

The decline of glucose concentration after treatment with different concentration of date seeds powder seeds may be due to the ability of the dates seeds to stimulate undifferentiated cells in the pancreatic langerhans islets differentiated to newly beta cells the period taken by the differentiated cells that secrete insulin, hormone can be consistent with the duration of treatment which led to get the response and secretion of the insulin hormone (Al- Kahteeb, 2008), or due to the date seeds high content of fiber such as cellulose and pectin and lignin which reduce the absorption of glucose from the intestines and thus help to reduce the level of sugar (Mekee and Lanter, 2000), or because date seeds had high concentration of phenols and antioxidants, magnesium and phosphorus in the date seeds, as research has proven its ability to reduce sugar level of (Al- Kattan, 2006), the found in date seeds to reduce glucose concentration in birds blood or perhaps due to biotin in date seeds which to activate gene expression responsible for gluco kinase enzyme in liver cells and also increase the effectiveness of this enzyme in the langerhans islets in the pancreas, this enzyme is glycolysis regulatory enzymes (Matschinsky, 2005).

Fig. (2) revealed significant increase ($p \leq 0.05$) in the concentration of F.S. H hormone in blood serum of female quail in all the groups quails treatment with different concentrations of dates seeds powder compared with the control group, and the most significantly increas has been shown groups of treatment with 2000 mg /kg body weight.

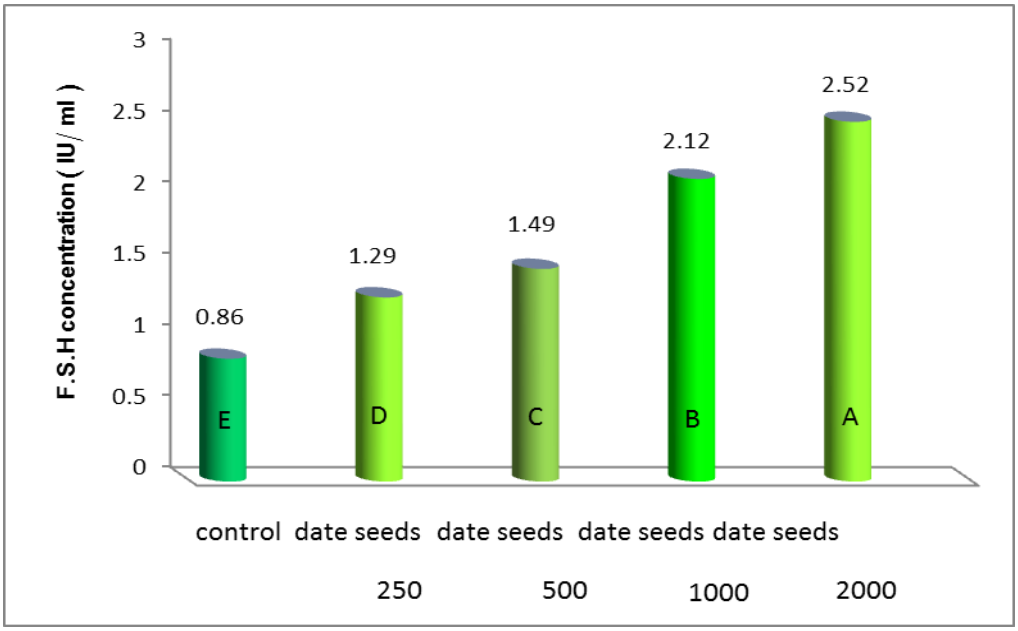

Fig. 2: The effect of date seeds treatment at (250,500,1000,2000) mg /kg body weight on the F.S.H concentration (IU/ ml) in quail female blood serum.

The values expressed in the arithmetic average (±) standard deviation and the number of birds / group = 6.
different letters indicate a significant differences at the level ($p \leq 0.05$).

Fig. (3) shows significantly increase in the concentration of L. H hormone ($P \leq 0.05$) in blood with different concentrations of date seeds powder treated, the more significant increase in the group treatted with 2000 mg/ kg b.w. of birds.

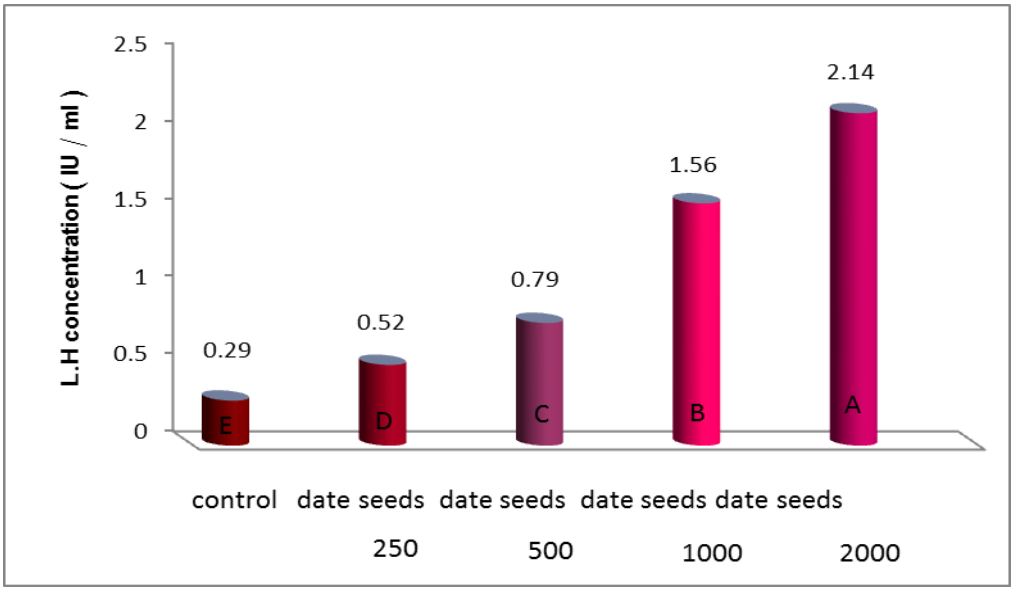

Fig. 3: The effect of treatment with date seeds powder at concentration (250,500,1000,2000) mg /kg body weight on the L.H concentration (IU/ ml) in quail female blood serum

The values expressed in the arithmetic average (±) standard deviation and the number of birds / group = 6. different letters indicate a significant differences at the level ($p \leq 0.05$).

Fig. (4) show a significant increase ($P \leq 0.05$) in the concentration of estrogen hormone in all treatment groups, and the more increase appeared in treatment with 2000 mg / kg b.w.

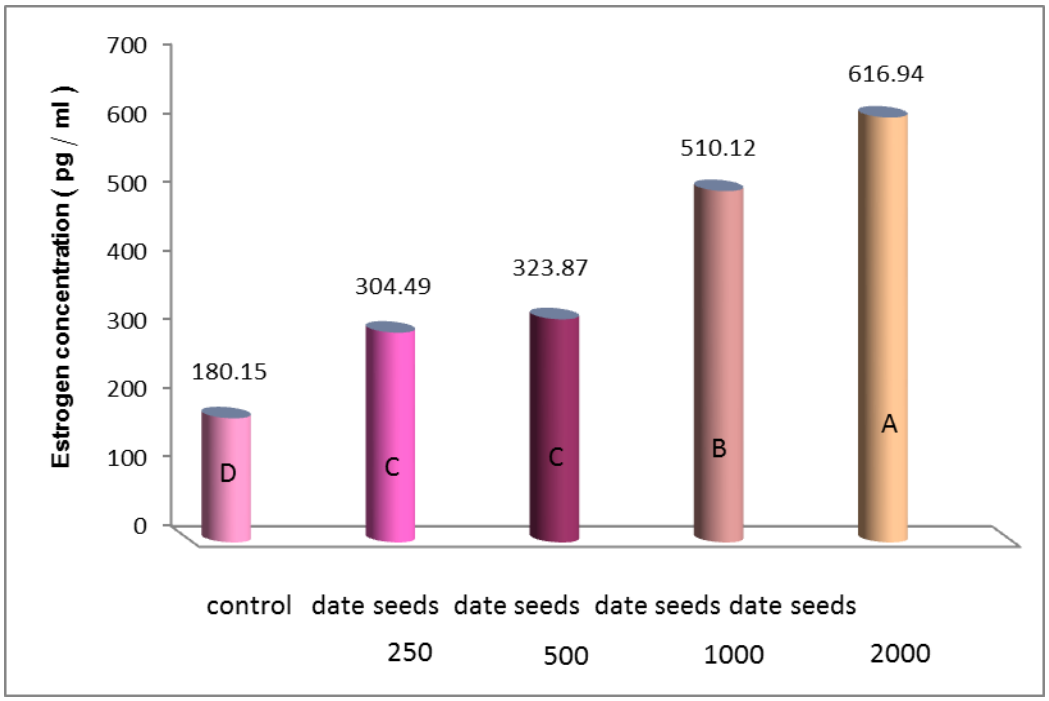

Fig. 4: Influence of date seeds powder treatment in Estrogen concentration (pg / ml) in the quail female serum

The values expressed in the arithmetic average (±) standard deviation and the number of birds / group = 6. different letters indicate a significant differences ($p \leq 0.05$).

The increase in FSH, LH estrogen concentration in birds serum treated with date seed could be it contain necessary materials for health and circulatory system such as vitamin C and Minerals salts, that had active role in stimulating secretion of endocrine and secretory glands besides stimulate the sympathetic nervous system. (Habib and Ibrahim, 2011).

Moreover, the presence of biotin vitamin and number of other and vitamins (E, C) in the date seeds a catalyst for the anterior lobe pituitary gland to secrets the hormones F SH and L H and estrogen (Yo shioka *et al*., 2004).

Fig. (5) shows significant (P≤0.05) increase in the concentration of the total antioxidants l capacity (TAC), in all treatments.

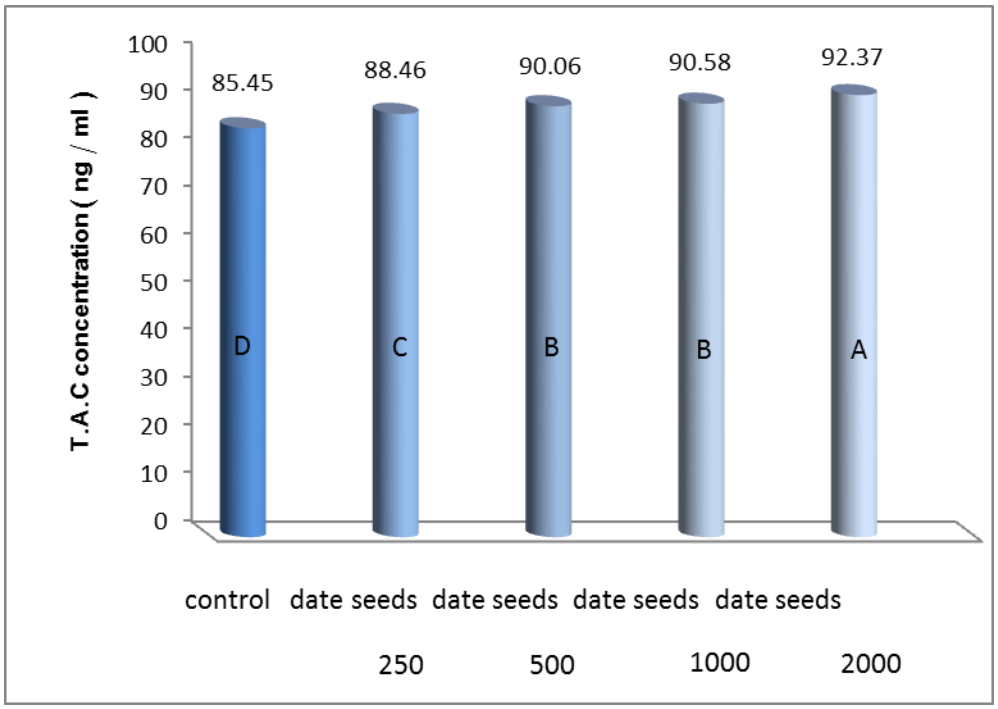

Fig. 5: Effect date seeds powder treatment in total anti oxidants capacity (ng / ml) in th quail **female blood serum.**

The values expressed in the arithmetic average (±) standard deviation and the number of birds / group = 6.
different letters indicate a significant differences (p≤0.05).

Antioxidant property is attributable to the presence of a wide range of phenolic compounds such as Ferulic acid, P- Coumaric, Sinapic acid, Flavonoids, Procyanidins (Bastway *et al*., 2008). Date seeds powder contain many of phenols, compound especially flavonoids that had the ability to scavenging free radicals (OH radical and superoxide) (Vya wahare *et al*., 2009). Date seeds with rich phenolic compounds posses antioxidants effect which prevents oxidation of the other particles (Vya wahare *et al*., 2009), also contain high level of antioxidants (Habib and Ibrahim, 2011). The most types of antioxidants in the dates seeds are hydrophilic, and show their ability in the membranes lipid, and this can result in flavonoids interaction with each layers of fat and water in the living membranes so protects them from oxidation processes (Verstraeten *et al*., 2003).

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