Effect of Different Aqueous Extract Doses of Mugworts (Artemisia herba alba) on Some Cocks Semen Characteristics

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Abstract: This study is designed to determine the effects of Artemisia herba alba extract on the semen characteristics of layer cocks. 32 Leghorn cocks (7-month-old, Average weight 1.4 kg) were treated with 1.5 ml/bird/day 5%, 10% and 15% dose of Mugworts (Artemisia herba alba) extracts, respectively. After 21 days, semen was collected by dorsal and abdominal massage. Concentration of (10%) a significantly increased ($p \le 0.05$) sperm motility, mass motility and viability. However, (15%) treatment significantly reduced ($p \le 0.05$) sperm viability and count test, as compared to other treatments. The second and third groups significantly reduced abnormal sperm, as compared to check treatment. The best rate of the Artemisia herba alba extract is 10% and the concentration of 15% may detrimental to the fertility of the cocks.

Keywords: cocks, motility, mass motility, viability and abnormality

تأثير الجرع المختلفة للمستخلص المائي لنبات الشيح Artemisia herba alba على بعض خصائص السائل المنوي للدىكة تحسين عبود السعيدي وعلي عبد الجبار ابراهيم و باس هادي جاسم كلية الطب البيطري/ جامعة القادسية كلبة الزر اعة/ جامعة القادسية

المستخلص:

الغرض من هذه الدراسة تحديد التأثيرات الجانبية لاستخدام المستخلص الماني لنبات الشيح على صفات الخصوبة. تم استخدام 32 ديك (سلالة اللكهورن الابيض) عمر 7 اشهر، معدل وزن الجسم 1.4 كغم. قسمت هذه الديكة على اربع مجاميع بالتساوي (8 ديك لكل مجموعة). المجموعة الاولى اعتبرت مجموعة سيطرة. تم تجريع المجاميع الثالثة والثالثة والرابعة ب 1.5 مل /طير يوميًا بالتراكيز 5% و10% 15% مستخلص نبات الشيح المائي على التوالي. جمع السائل المنوي من الديكة بواسطة المساج البطني بعد 21 يوم من بداية التجربة. وتم تقبيم استخدام مستخلص الشيح المائي على صفات الخصوبة الفيزيائية في الديكة بواسطة المساج البطني بعد 21 يوم من بداية التجربة. وتم تقبيم استخدام مستخلص الشيح المائي على صفات الخصوبة. أو مان 15% مستخلص الشيح المائي على صفات الخصوبة الفيزيائية في الديكة بواسطة المساج البطني بعد 21 يوم من بداية التجربة. وتم تقبيم استخدام مستخلص الشيح المائي على صفات الخصوبة الفيزيائية في الديكة باستخدام المعايير التالية: عدد الحيوانات المنوية ، والحركة الفردية (٪) ، والحركة الجماعية (٪) ، والحيوية (٪) والحركة المائي على صفات الخصوبة الفيزيائية في الديكة باستخدام المعايير التالية: عدد الحيوانات المنوية ، والحركة الفردية (٪) ، والحركة الجماعية (٪) ، والحيوية (٪) ، والحركة المائي على صفات الخصوبة الفيزيائية في الديكة باستخدام المعايير التالية: عدد الحيوانات المنوية ، والحركة الفردية (٪) ، والحركة الجماعية (٪) ، والحيوية (٪) والسرح (٪) ، والحيوية (٪) ، والحركة الجماعية (٪) ، والحيوية (٪) ، والحيوية (٪) ، والحيوية (٪) والمي بتركيز 10% على بقركيز 10% على بقية مجاميع التجربة في كل من اختبار نسبة الحركة الفردية و الحركة الجماعية وحبوية المنوية من جهة اخرى انخفضت معنوياً المجموعة الرابعة المجرعة بستخلص نبات الشيح المائي بتركيز 15% والميائية المنوية. وارثالت المنوية المورية المومي عالي مرامير والثالثة والثالثة من جهة الحرى المعورية الميوية المورية. وارثالت المنوية والثالثي من جهف المردية و المورية و معوية الميرية والمائي بتركيز 15% والم معالي وحبوية المجرعة معاميع التجربة في من من جبوبية والثالثة وارثالثة وارزابة معنوياً على بقري وال والى على بتركيز 15% والميع التجربة والثالثة والمائية والثالثة والنا المنوية معنوياً على بقركين والميرية والمعموع عنين الثانية والثالثة وا

الكلمات المفتاحية: ديكة، الحركة الفردية ، الحركة الجماعية ، الحيوية ، الحيوانات المنوية المشوهة.

Introduction

Artemisia herba-alba is one of medicinal herbs, It's a dwarf shrub grown in arid areas usually, (Karim et al., 2011). It's local name is Sheh (in Arabic), (Mansi et al., 2007). This plant а bioactive complexes including produces flavonoids, steroids, coumarins, phenolics, lipids, purines, aliphatic compounds, triterpenoids, monoterpenoids and sesquiterpenoids such as artemisinin, artemisinic acid dihydroartemisinic acid, and arteannuin B. They are stored in the leaves and inflorescence (Ferreira and Janick, 1995). The mugworts (Artemisia herba-alba) possesses antidiabetic activity (Tastekin et al., 2006). Antifungal and anti-inflammatory activities (Abu-Darwish *et* al., 2015) a natural antimicrobial to inhibit contamination of the Escherichia coli O157:H7 and the Salmonella typhimurium in fresh produced, additional health benefits because the antioxidant characteristics of its residue, (Rafiq et al., 2016). Long-time exposure 12 weeks of female rats to Artemisia herba Alba resulted harmful effects on the reproductively and fertility, (Motasem et al., 2007). Aqueous extract of mugworts (Artemisia herba-alba) has an anti-cancer effect in mice, (Khalil et al., 2016). A literature survey in poultry revealed that the use of Artemisia herba-alba feed is beneficial as anticoccidial agent, (Bensegueni et al., 2014). It is a good anthelmintic alternative therapy, and is recommended to control ascaridosis in turkey (Seddiek et al., 2011). The application of mugworts (Artemisia herba-alba) to the Japanese quail diets led to a significant improve egg production rate (Latif, 2016). Another type of Artemisia, *Artemisia argyi*, can improve the antioxidative activity of small intestine in chicken broilers (Zhao *et al.*, 2016). However, very low levels application of *Artemisia herba-alba* plant do not stimulate broiler growth (Arabi *et al.*, 2016).

In poultry, there are no authorized studies regarding the side effects of mugworts (*Artemisia herba-alba*) on fertility. This study aims to find out the effects of different doses of aqueous extract of *Artemisia herba alba* (5%, 10% and 15%) on the semen characteristics of layer chicken cocks following chronic oral intake.

Materials and Methods

The experiment was conducted in the poultry field at the college of Agriculture / University of Qadisiyah during the period of 1/12/2017 to 31/12/2017. 32 white Leghorn cocks (7-monthold, Average weight 1.4 kg) were randomly distributed into four groups, equally. The first group considered as a control. Other groups are dosaged with 1.5 ml/bird/day concentrations of 5% and 10% 15% extract of artemisia herba alba, respectively. Cocks trained the semen collection process for 10 days prior starting of the experiment. Semen was collected by dorsal and abdominal massage to avoid contamination of semen by feces cut the fed for birds for 4 hours before collection. Fertility characteristics (numbers of spermatozoa, individual motility (%), mass motility (%), viability (%) and abnormality (%) were measured after 21 days. Birds were provided water and diet free of charge and exposed to 16 hours of light daily.

Semen evaluation: The sperm count of an ejaculate was determined by using a Neubauer hemocytometer chamber. It was calculated according to the procedure of (Allen and Champion, 1955). Individual and mass motility were estimated depending on (Parker *et al.*, 1942). The percentage of viability and abnormality were calculated according to method of (Clark *et al.*, 1984). Eosin stain were used and at least 200 sperm were counted. Pinky color sperm were regarded as dead and spermatozoa that appeared without any color were regarded as alive.

Preparation of the aqueous extract: Mixing 10, 20, 30 gram of *Artemisia herba-alba* (1/2 leaves and 1/2 blossoms) with 200 ml of distilled water using a blender and left for 24 hours a under room temperature. The mixture was filtered by using several layers of medical gauze to eliminate plankton then centrifuged at 3000 r per min for 10 minutes. Another round of filtration was done using filter papers (whatmann filter paper 0.45 Micro Meter) for clarification. The extract was drought by an oven for 40 m and then saved in fridge until use, (Hernandez *et al.*, 1994).

Statistical analysis: SPSS18 program was used to analysis the collected date, the Completely Randomized Design and means were compared by Duncan's multiple range test at $P \le 0.05$.

Result

The use of the mugworts (*Artemisia herba-alba*) is safe in term of the absence of mortality or clinical signs in all of the experimental groups. There is a significant decline at ($P \le 0.05$) in the number of sperm in G4 compared to the control and other groups. No significant differences in the number of sperm among control, the second and the third groups, Figure (1).

Figure (2) presents a significant increase ($P \le 0.05$) in individual sperm motility percentage in G3 as compared with other treated groups. It shows also no significant differences among G1, G2 and G4.

There is a significant increase ($P \le 0.05$) in mass motility percentage in G3 as compared with the other treated groups, figure (3). It presents no significant relationship among G1, G2 and G4.

There is a significant increase ($P \le 0.05$) in viability percentage in the third group compared to the other. In contrast, significant decline at ($P \le$ 0.05) was presented in the percentage of viability in G4 as compared with the control and to the other treated groups. No significant differences is shown in viability percentage between the control and G2.

Significant increase ($P \le 0.05$) is noticed in the abnormality sperm percentage in G4 as compared with other treated groups, Figure (5). The control group had significant increase ($P \le 0.05$) compared with the second and the third groups. No significant relationship between the second and the third groups existed.



Figure (1) Effect of treatment Cocks with different doses of extract *artemisia herba alba* on count of spe



Figure (2) Effect of treatment Cocks with different doses of extract *artemisia herba alba* on Individual Sperm motility (%).



Figure (3) Effect of treatment Cocks with different doses of extract *artemisia herba alba* on mass motility (%) of spermatozoa.



Figure (4) Effect of treatment Cocks with different doses of extract *artemisia herba alba* on viability (%) of spermatozoa.





Discussion

Most types of *artemisia* contain artemisinin, which is the main ingredient in the plant. Its quantity varies according to the plant of the Artemisia, (Ferreira and Janick, 1996). The use of the artemisinin in chickens has a good safety margin, but the very high single dose of (1250 and 2500 mg / kg) causes transient neurological signs, (Arab *et al.*, 2009). Applying mugworts (*Artemisia herba-alba*) to the diet of 7-days-old Bovan chicks for 9 weeks at a level of 2% is safe, but high level of (10%) decreases growth and damaged the vital organs, (Ibrahim *et al.*, 2004).

The results indicated that the best concentration of the mugworts (*Artemisia herba-alba*) extract to enhance fertility characteristics is 10% in each of the individual motility, mass motility, viability and abnormality percentages. The third group significantly increases as compared with the other groups in the tests of individual motility, mass motility and viability percentages of the sperm. The third group that is dosaged with 10% of Artemisia herba alba *extract significantly* decreases the abnormality test as compared with the fourth group and the control group. The control group had the highest sperm count test. concentration of 15% of Artemisia herba alba extract (G4) decreases viability (%) and abnormality (%). This result agrees with the results that were obtained by (Khataibeh and Daradka, 2007). Motility, density and weight of sperm of the reproductive organs decreased to a significant levels in treated male, which rats with 100 mg/kg body weight for 60 day Artemisia herba-alba when compared with the control. However, there is no histopathological changes in the testis of the male rabbits those treated with 0.2

(Abd, 2007).

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