

Effect of alcoholic extract of *Apium graveolens* leaves on some physiological properties of a broilers

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Abstract

This study was carried out on fourteen broiler arranged between (1100 – 1500) gm. in weight to estimate the effect of drenching of alcoholic extract of *Apium graveolens* leaves on some physiological properties. The birds were divided into two groups which are control and treatment group seven birds for each group. The birds in both groups are housed in same condition, include temperature, light, food, and water during experiment period. The control group caged with 1 ml distilled water while treatment group caged with 10 mg/kg. B.W. of alcoholic extract of *Apium graveolens* leaves dissolved in 1 ml of distilled water for two weeks. The birds were weighted and blood sample were taken two times before and after treatment. The results of this study was revealed a significant increase in red blood cells count, hemoglobin concentration, and packed cell volume, while there is no significant changes in white blood cells count, and body weight .

key words: *Apium graveolens*, physiological properties, birds

تأثير المستخلص الكحولي لأوراق نبات الكرفس *Apium graveolens* في بعض الصفات الفسلجية في الدجاج

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الخلاصة

اجريت هذه الدراسة على اربعة عشر طيرا" من فروج اللحم تراوحت اوزانها بين (1100 - 1500) غم بهدف تحديد تأثير التجريب اليومي للمستخلص الكحولي لأوراق نبات الكرفس في بعض الصفات الفسلجية . تم تقسيم الطيور الى مجموعتين هما مجموعة السيطرة ومجموعة المعاملة بواقع 7 طير لكل مجموعة . تم وضع الطيور تحت ظروف موحد من حرارة وضوء وطعام وماء طوال مدة التجربة . جرعت مجموعة السيطرة (1) مل من الماء المقطر فقط اما مجموعة المعاملة فتم تجريعها بـ 5 /ملغم /كغم من وزن الجسم من المستخلص الكحولي لأوراق نبات الكرفس مذابة في (1) مل من الماء المقطر ولمدة اسبوعين . تم وزن الطيور وجمع عينات الدم قبل المعاملة وبعد مرور اسبوعين من بدء التجريب . اظهرت نتائج الدراسة الحالية عن وجود زيادة معنوية في عدد خلايا الدم الحمر وتركيز الهيموكلوبين في الدم وحجم خلايا الدم المرصوص . كما اشارت النتائج الى عدم حدوث تغيرات معنوية في معدل اعداد خلايا الدم البيض ووزن الجسم لدجاج اللحم .

الكلمات المفتاحية: المستخلص الكحولي ، نبات الكرفس ، الصفات الفسلجية، الدجاج

Introduction

Historically, all medicinal preparations were derived from plants, whether in the simple form of plant parts or in the more complex form of crude extracts, mixtures, etc. (1). *Apium graveolens* is a biennial herb that has been used consistently throughout history in medicinal preparations, food flavoring and preparation , and is known in the vernacular as *A.graveolens* (2). *Apium graveolens* is a flowering biennial from the family umbellifera. (3). *A. graveolens* has been used as an aphrodisiac, anthelmintic,

antispasmodic, carminative, diuretic, emmenagogue, Laxative, sedative, stimulant, and toxic (4,5). Extracts of *A. graveolens* have been investigated for their hepatoprotective, antinociceptive, anti – inflammatory and antihyperlipidemic properties. The studies show that *A. graveolens* extract can exhibit a degree of protection against established hepatoxins, including carbon tetrachloride, acetaminophen (paracetamol), and thioacetamide (6,7,8). The lipid lowering effects of *Apium graveolens* extract have

been studied in rats (9, 10) and rabbits (11). *A. graveolens* and its flavonoid constituents have been investigated as neuroprotective agents against neurodegenerative pathologies that result from inflammatory etiologies. Extracts of *A. graveolens* leaves and roots have been shown by both *in vitro* and *in vivo* experiments to protect against oxidative stress and these antioxidant effects may be a result of the flavonoid content of *A. graveolens* (12). Luteolin and additional flavonoids have been shown to reduce the release of reactive oxygen species and to increase expression of enzyme that protect antioxidant properties (10,13). In addition, the flavonoids apigenin and luteolin exhibit high biological activity and pronounced anti-inflammatory effects (14).

Materials and methods

1- preparation of alcoholic extract for *Apium graveolens*. It is extracted according to Harbone, (1975). (15).

2- Experimental animals. This experiment carried out in animal house in college of veterinary medicine in AL-Qadisiya university, fourteen local chickens were used (55 – 65) days in age, (1100 – 1500) gm in weight, the chickens putted in cages and housed in same condition, include temperature, lighting, food, and water. The birds divided for two equal group. seven birds for each group:-

A-control group: administered 1 ml of distilled water for two weeks.

B-treatment group: administered 1 ml (contain 10 mg/kg) B. W. of *Apium graveolens* extract for two weeks.

3- samples collection: - Blood samples were collected (2 ml/ bird) from wing vein before and after treatment by using of syringe contain heparin as anticoagulant.

4- Blood parameters: -

A-Red blood cells count (cell / mm³). The red blood cells were counted (cell / mm³) by using of hemocytometer and diluting fluid and special pipette (16).

B-Hemoglobin concentration (g/dl) it is measured by cyanomet hemoglobin method by using Drabking's reagent (17).

C-Packed cell volume (%) it is measured by microhematocrit and capillary tubes contain heparin, and put in microcenterifuge in 12000 Rpm for five minutes and measured packed cell volume by service device (18, 19).

D-White blood cells count (cell / mm³) it is measured by hemocytometer and Thomas solution and special pipette (20).

E-Statistical analysis:- The obtained data were analyzed by complete Randomized Design (CRD) and least significant Differences (LCD) to compare parameters averages between control and treatment group ($p \leq 0.05$) (21).

Results and discussion

The results of the present study revealed that cavage chickens treated with 10 mg / kg. B. W. of *Apium graveolens* alcoholic extract shown significant increase ($p \leq 0.05$) in Erythrocytes count (table 1) and hemoglobin concentration (table2) and packed cell volume (table 3) in treated group compared with control group. This increase may be due to stimulation of Erythropoiesis by Erythropoetin which is released from the kidney (22). Some components of *Apium graveolens* cause increase the level of this hormone which then lead to increase Erythrocytes production and then increase hemoglobin concentration and packed cell volume (23) Also this increase may be due to involving of *Apium graveolens* of high quantity of Iron which consider essential element in Erythropoiesis (24) Also this increase may be return to antioxidants that found in *Apium graveolens* like 2 – methyl propanol, gomosenine and actadecenamamide which protect Erythrocyte membrane against free radicals action and lipid peroxidation and this may prevents Erythrocyte lyses (25, 26). Therefore the increase of total erythrocytes number lead to increase in hemoglobin concentration and packed cell volume. Also the result of this study was revealed that there are non-significant differences ($p > 0.05$) in Leucocytes number between control and treated group (table 4). which may be due to little dose (10 mg / kg) of extract, which don't cause immune

response, also remaining of these cells within normal value may indicate that reserving of extract don't cause any stress to the birds while these cells increase due to stress infection (17) also there is increase in body weight of treated group when compared with control, but this increase is non-significant ($p > 0.05$) (table 5). which may be due to role of *Apium graveolens* in increase proteins level and improvement of metabolism and energy. The *Apium graveolens* contain glycosides which have stimulatory effect for proteins anabolism and prevent their catabolism. (27, 28).

Table (1) Effect of alcoholic extract of *Apium graveolens* leaves on Erythrocytes count (million cell / mm³) for Broilers.

group	pretreatment	post treatment
control	aA 2.99 ± 0.28	aA 3.32 ± 0.28
treatment	aA 2.47 ± 0.25	bB 4.40 ± 0.42

Numbers = mean ± standard error The different small letters means significant differences within group ($p \leq 0.05$) The different capital letters means significant differences between groups ($p \leq 0.05$).

Table (2) Effect of alcoholic extract of *Apium graveolens* leaves on hemoglobin concentration mean (gm/dl) for Broilers.

group	pretreatment	post treatment
control	aA 11.1 ± 0.54	aA 11.6 ± 0.54
treatment	aA 11.4 ± 0.89	bB 13.6 ± 0.54

Numbers = mean ± standard error The different small letters means significant differences within group ($p \leq 0.05$). The

different capital letters means significant differences between groups ($p \leq 0.05$).

Table (3) Effect of alcoholic extract of *Apium graveolens* leaves on pocked cell volume mean (%) for Broilers.

group	pretreatment	post treatment
control	aA 33.20 ± 0.96	aA 33.60 ± 0.81
treatment	aA 32 ± 1.22	bB 44.80 ± 1.21

Numbers = mean ± standard error The different small letters means significant differences within group ($p \leq 0.05$). The different capital letters means significant differences between groups ($p \leq 0.05$).

Table (4) Effect of alcoholic extract of *Apium graveolens* leaves on leukocytes count (cell / mm³) for Broilers.

group	pretreatment	post treatment
control	aA 2696 ± 138	aA 2696 ± 138
treatment	aA 2528 ± 129	aA 2560 ± 183

Numbers = mean ± standard error The similar letters means non-significant differences ($P > 0.05$).

Table (5) Effect of alcoholic extract of *Apium graveolens* leaves on body weight mean (gm) for Broilers.

group	pretreatment	post treatment
control	aA 1350 ± 70	aA 1350 ± 70
treatment	aA 1340 ± 73	aA 1560 ± 79

Numbers = mean ± standard error similar letters means non-significant differences ($p > 0.05$).

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