

## RESEARCH ARTICLE

## EFFECT OF AQUEOUS VITEX *Angus-Cactus* EXTRACT ON BODY WEIGHT, HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS OF CHICKEN

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Received: 10 September 2023 / Accepted: 07 December 2023 / Published online: 31 December 2023

### Abstract

The current study aims to investigate the effect of the Vitex *Angus-cactus* leaves extract on body weight, haematological and biochemical of chicken. The chicken was divided into four groups. The first group was given orally 5mg, the second 10 mg, the third 15 mg dose of Vitex extract every day for a period of 30 days and the fourth group served as a control group. The result revealed an increase in the body weight of treated chicken by 11.76 % at a 15 mg dose of Vitex extract compared to the control group. Non-significant increase was in haemoglobin (Hb) amount and the total erythrocyte (RBC) count, while white blood cells (WBC) decreased significantly in treated chicken. The plasma aspartate aminotransferase (AST) was decreased significantly at all doses of vitex extract and alanine aminotransferase (ALT) increased by 41% only at 15 mg dose of extract. The plasma urea level does not changed by treatment in comparison to the control group. The total serum testosterone was not detectable by treatment of 10 mg and 15 mg doses of Vitex extract. In conclusion, the treatment of chicken with some dose of Vitex leaf extract can improve their body weight and some haematological and biochemical parameters.

**Keywords:** Vitex angus, Castus leaves extract, Body weight, Haematological, Biochemical Parameters.

### Introduction

The Vitex *Angus-cactus* is a species that is primarily found in Southern Europe, Central Asia, and the Mediterranean region [1] and the Yemeni people refer to it by names like kaf Maryam.

Traditional medicine has long utilized Chaste tree (vitex *Angus-cactus*) extract to regulate the process of reproduction and enhanced nutrition [2] Numerous compounds, including iridoids, flavonoids, terpenoids, essential oils, ketosteroids, and vanillic acid, are present in this plant [3]. These compounds are bioactive components with biological activities like antioxidant, anticarcinogenic, antiviral, antibacterial, anti-inflammatory, nutritious, and diuretic [4, 5]. It is used as a treatment for premenstrual syndrome, abnormal menstrual cycles, mastodynia, hyperprolactinemia, and low fertility [6, 7].

The Vitex exhibit a normalizing or balancing effect on hormone production and to increase luteinizing hormone (LH) levels without affecting follicle-stimulating hormone (FSH) in women. Vitex fruit extract improve serum levels

of sex hormones (LH, FSH, estrogen) in adult female rats [8]. Vitex *Agnus-castus* is of the main plants used in herbal medicine for regulating hormones and women's hormonal sicknesses [9]. Vitex *Agnus-castus* is one of phytoestrogen, where the phytoestrogens could play a main role in the reproductive process, like estrogens [10].

This study aims to investigate the potential effect of Vitex alcoholic extract on blood biochemical parameters and the body weight of the chicken.

### Materials and Methods

#### *Plant collection*

The vitex *angus-cactus* leaves were collected from Al-kamosri garden, Aden, Yemen, then washed thoroughly 2-3 times under running tap water and then sterile distilled water. These leaves were dried at room temperature for 10 days in open-air protected from direct exposure to sunlight and were subsequently ground to a powder. The dried powder was stored in an air-tight bottle at 28°C for further extraction (ref).

**Extraction:** Crude extract of vitex angus-cactus obtained using aqueous solvent (water). The aqueous extraction was carried out by suspending 400 g powder in 2 liters of sterile water and soaking for two days (48 h) with continuous shaking, after that the extract was filtered through double-layered muslin cloth and then filtrated through Whatman NO. 1 filter paper (ref.).

**Animals:** Six weeks old chickens (n= 20) weighted 2400 to 2500g are obtained from Al-zailai corporation for poultry, Lahj, Yemen and were housed in cages to acclimatization for one week in laboratory conditions at room temperature between 30–35°C. After the acclimatization period, chickens were divided into four groups (n=6) randomly and each group was kept in separate cages and fed ad lantium ) [11]

*Treatment and blood collection*

Group 1 served as control, and groups 2, 3, and 4 were orally treated with 5 mg, 10 mg, and 15 mg doses of vitex angus-cactus extract for 30 days respectively. Every chicken was weighed before experiment, then weighed after 30 days of the experiment period.

The blood samples were collected with a heparinized syringe from the wing vein and kept in tubes. The total WBCs were counted after diluting the blood with saline solution (0.75%) by Neubauer haemocytometer slide. The haemoglobin [Hb] content was measured according to Drabkin [11]. The remaining blood was used to obtain the plasma by centrifugation (4000 rpm) for 5 min. The plasma AST, ALT, urea, testosterone, and craetinine were determined spectrophotometry using Monlab test kits.

*Statistical analysis*

The Data analysis of variance carried out by using the Genstat statistical software version 9.

**Result**

The body weight was not changed in chicken, which was administered by 5 mg and 10 mg vitex extract, whereas the 15 mg of extract caused increasing body weight by 11.76 % (300 g) in relation to the control after one month (Table 1).

**Table 1.** Growth performance of chickens exposed to different concentrations (5 mg, 10 mg, and 15 mg) of vitex extract

Vitex extract con.	Control	5 mg	10 mg	15 mg
Weight (gm)	2550	2540	2550	2850
Weight gain (gm)	--	-10	00	300
Percentage (%)				11.76

The vitex extract did not significantly increase in (RBC) and (Hb), where the extract produced about 50% and 30% reduction in WBC count at 5mg and 10 mg of treatment respectively compared to the control (Table 2).

**Table 2.** The effect of vitex extracts (5 mg, 10 mg and 15 mg dose) on some blood parameters

Treatment (mg)	RBC×106 mm3	WBC mm3	Hb %
Control	6.23 ± 0.7	11600	<b>10.6 ± 0.6</b>
Extract (5 mg)	6.37 ± 0.5	5666.7	<b>10.83± 0.6</b>
Extract (10 mg)	6.6± 0.2	7000	<b>11.23± 0.2</b>
Extract (15 mg)	6.47 ± 0.1	9333.33	<b>11 ± 0.12</b>

The changes in AST and ALT activities are used to check liver function in chicken administered by different doses of Vitex extract relative to the control group. The results revealed that vitex extract caused a significant decrease (P< 0.05) in the activity of AST (131±3.39, 136±7.48 and 105±2.16 at 5 mg, 10 mg and 15 mg doses respectively) compared to the control group (184±143.5). The plasma ALT was increased at 10 mg and 15 mg doses (24±2 and 19.66 ±2.08 respectively) compared to the control group (17.33±2.5). The plasma urea did not show any change at all doses. However, a significant decrease in total serum testosterone was observed at 10 mg and 15 mg of extract (Table 3).

**Table 3.** Vitex effect on some biochemical tests ( AST, ALT and urea) in plasma of the chickens [mean ± SD]

Treatment (mg)	AST	ALT	Urea	Testosterone
Control	184±143.5	17.33±2.5	24.66±0.9	0.27±0.8
Extract (5 mg)	131±3.4	17±2.6	24.33±0.5	0.29±0.3
Extract (10mg)	136±7.5	24±2.0	24.66±1.2	00
Extract( 15mg)	105±2.2	19.66±2.1	24.33±0.5	00

**Discussion**

The present study showed that Vitex agnus castus extract was effective in successful growth performance in male chickens. The body weight of treated chicken was significantly increased by 11.76% (300g) at 15 mg dose of Vitex extract about the control after one month. The findings in our study were in agreement with the results of Turan and Akyurt [12] on African catfish, Ahilan and Nithiyapriyatharshini [13] on goldfish, Tayebah Enayat Gholampour *et al.* [14] on zebrafish and EL-SPEIY *et al.* [15] on rabbits. They reported that growth performance was positively affected by Vitex extract treatment or supplements in food. Body weight of does were significantly influenced by 15 mg dose of vitex aqueous extract, this result agreed with Akhondzadeh [16] and Abd El Ghany *et al.* [17], who showed the enhancement in body weight might be attributed to the nutrient of vitex extracts.

The extract of vitex agnus-castus resulted in a decrease in white blood cell count, packed in female chicken, while no significant increase occurred in red blood cells and hemoglobin compared with the control group. These results agree with Mustafa [18] and Abd El Ghany *et al.* [17], who reported that vitex extract had no significant effect on haematological parameters compared with the control

group. The previous study reported that the decrease in blood parameters may be due to the presence of flavonoids in the vitex plant [19,20]. The essential oils of the vitex plant can affect blood parameters by inhibiting of synthesis of blood cells [20]. The vitex extract not influenced plasma urea level, but lead to a significant decrease in plasma AST level at different doses. The ALT level slightly increased at 15 mg of vitex extract, our result disagreed with Abd El Ghany *et al.* [17], who not observed change in AST and ALT by treatment of vitex extract in rabbits. The total serum testosterone was not detectable by treatment of 10 mg and 15 mg doses of Vitex extract. Merz *et al.* [21] demonstrated that Vitex agnus-castus with a high dose caused a slight decrease in prolactin concentration in the blood of healthy men, while the low doses showed the opposite observation, in the same experiment. It was believed that the prolactin reduction influenced Follicle-stimulating hormone and estrogen levels in women as well as testosterone levels in men.

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## مقالة بحثية

## تأثير المستخلص المائي لمستخلص نبات كف مريم (Vitex Angus-cactus) على المؤشرات الدموية والكيميوحيوية في الدجاج

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استلم في: 10 سبتمبر 2023 / قبل في: 07 ديسمبر 2023 / نشر في 31 ديسمبر 2023

## المُلخَص

تهدف الدراسة الحالية إلى معرفة تأثير مستخلص أوراق كف مريم (Vitex Angus-cactus) على وزن الجسم والدم والمؤشرات الدموية والكيميوحيوية للدجاج. تم تقسيم الدجاج إلى أربع مجموعات، جرعت المجموعة الأولى 5 mg، والثانية 10 mg، والثالثة 15 mg من المستخلص عن طريق الفم يوميا لمدة 30 يوما والمجموعة الرابعة (الشاهد) لم تجر بالمتخلص. أظهرت النتائج زيادة في وزن الدجاج المعالج بنسبة 11.76% عند 15 mg من مستخلص نبات كف مريم مقارنة بمجموعة الشاهد. لم تظهر زيادة معنوية في كمية الهيموجلوبين (Hb) والعدد الكلي لكريات الدم الحمراء (RBC)، في حين انخفضت خلايا الدم البيضاء (WBC) بشكل ملحوظ في الدجاج المعالج. انخفض إنزيم (AST) في البلازما بشكل ملحوظ في جميع جرعات المستخلص النباتي، بينما أظهر إنزيم (ALT) زيادة بنسبة 41% عند جرعة 15 mg من المستخلص. لم يتغير مستوى اليوريا في البلازما في المجموعات المعالجة مقارنة بمجموعة شاهد. أنخفض مستوى هرمون التستوستيرون في بلازما المجموعة المعالجة عند جرعات 10 mg و 10 mg إلى مستوى كبير لا يمكن قياسه. نستنتج من ذلك أن معالجة الدجاج بجرعة معينة من مستخلص أوراق نبات كف مريم أدى إلى تحسين وزن الجسم وبعض المعايير الدموية والكيميائية الحيوية.

الكلمات المفتاحية: أوراق vitex angus-castus، مستخلص، مؤشرات دموية، الكيميوحيوية.

## How to cite this article:

W. Thabet, K. S. Alsweedi, S. S. Mohammed, "EFFECT OF AQUEOUS VITEX Angus-Cactus EXTRACT ON BODY WEIGHT, HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS OF CHICKEN", *Electron. J. Univ. Aden Basic Appl. Sci.*, vol. 4, no. 4, pp. 314-317, December. 2023. DOI: <https://doi.org/10.47372/ejua-ba.2023.4.297>



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