The effect of aqueous extract of *Marticaria Chamomilla* flowers on some physiological properties in broiler chickens.

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Abstract

This study was conducted on broiler chickens to investigate the effect of *Marticaria chamomilla* flowers extract on some physiological properties. One day age Fawbro birds (Average weight 55g) were used in this study, they fed *ad libitum* until 7 weeks age. (60 chicks) were divided into three groups (each group has 20 birds).

1-treatment one: administrated orally the aqueous extract of *Marticaria chamomilla* flowers at concentration 50mg /kg body weight .

2-treatment two: administrated orally the aqueous extract of *Marticaria chamomilla* flowers at concentration 100mg /kg body weight

3-control group: administrated distilled water .At the end of experiment blood samples were taken from brachial vein for ten birds of each group for hematological and bio chemical examination ,the following parameters are used:- serum glucose concentration, serum cholesterol concentration ,hemoglobin concentration ,packed cell volume ,body weight and food intake. Results showed significant decrease ($p<0.05$) in glucose concentration in treatments groups compared with control, and significant decrease ($p<0.05$) in cholesterol concentration in treatments groups compared with the control. While there was no significant effect on hemoglobin concentration, packed cell volume, body weight and food intake in treatments groups compared with the control.

Introduction

Chamomile is a daisy like, apple-scented flower that has used medicinally for thousands in human (12). Chamomile, *Marticaria chamomilla*, widely used through the world .its primary used is as sedative anxiolytic and antispasmodic. The use of chamomile comes from two Greek words meaning "ground apple" for its apple like smell (15). Chamomile main active constituents are chamazulene, apigenin and bisabolol. the proazulenes in the herb produce chamazulene on steam distillation which markedly antiallergenic (9). Due to its antispasmodic properties chamomile is a good remedy for all cramping pains especially for an abdominal cramping in children at the same time it has a carminative effect of relieving flatulence (10). In pediatric medicine chamomile is

used as tea or syrup (2). it can be taken as a herbal tea . one of the active ingredients of the essential oil from chamomile is the terpene and bisabolol, and other active ingredients include farnesene, chamazulene, flavonoids (including apigenin, quercetin, patuletin and luteolin and coumarin. (16) A review of the medical literature reported a number of beneficial effects for chamomile *in vitro* and animal tests. Research with animals suggests antispasmodic anxiolytic, anti-inflammatory and some anti-mutagenic and cholesterol-lowering effects for chamomile. It also showed some benefit in an animal model of diabetes ((8) .*In vitro* chamomile has demonstrated moderate antimicrobial and antioxidant properties and significant anti platelet activity (14).

Materials and Methods

Animals :- 60 birds (Fawbro) were used and reared *ad libitum* from one day age until 7 weeks of age, the birds divided into 3 groups at age one week.

1-treatment 1: have 20 birds administered the aqueous extract of *Marticaria chamomilla* at concentration 50 mg/kg.

2- Treatment 2: have 20 birds administered the aqueous extract of *Marticaria chamomilla* at concentration 100 mg/kg.

3- Control: have 20 birds administered distilled water.

((Composition of ration in broilers))

Substances	Starter ration percentage	Finisher ration percentage
Corn	56.6	54
Wheat	18	20
Soyben meal	13.4	19
Concentrated protein	10	5
Calcium and phosphorus	0.7	0.7
Limestone	0.5	0.5
Methionin	0.5	0.5
Salt	0.3	0.3
Metabolic energy	3010	2900
Crude protein	22.04	20.07

Chemicals :- Cholesterol kit form SpinReact laboratories Ltd. Glucose kit from spin React laboratories Ltd, distilled water and hemoglobin kit from Randox laboratories Ltd.

Plant :- chamomile flowers obtained from herbalists, cleaned and powdered then extracted according to Harbornes' method (6). Different concentrations are prepared 50 mg/ kg, 100 mg/kg.

Instruments: - spectrophotometer, hematocritcentrifuge.

Blood samples: blood samples were taken from brachial vein for ten birds from each groups and put in test tubes containing anticoagulant (EDTA) for hematological analysis and in test tubes without

anticoagulants to prepare serum for biochemical analysis.

Tests: cholesterol levels were measured according to Kaplan method (7, 11) hemoglobin concentration and packed cell volumes are measured according to Cole's method (4).

Food intake: Weekly food intakes are measured for each group. Food intake (g) = quantity of total given food- quantity of remained food.

Body weight: Weekly body weights are measured for each group

Statistical analysis: - Data analyzed using F-test and Least Significant Differences (LSD) between Means. (1).

Results

1-glucose concentration: there is concentration in treatments groups significant decrease ($p < 0.05$) in glucose compared with the control table -1-

Table -1- the effect of *marticaria chamomilla* extract on blood glucose concentration in broiler chickens.

groups	Glucose concentration in mg /dl
Treatment1	182 $\pm$ 3.15b
Treatment2	163 $\pm$ 2.95b
control	211.25 $\pm$ 2.25a

-the values are mean $\pm$ standard error.

-the different letters indicate significant differences ($p < 0.05$) between groups.

-similar letters indicate no significant difference between groups.

2-Cholesterol concentration: there is concentration in treatments groups significant decrease ($p < 0.05$) in cholesterol compared with control. Table(2)

Table (2)the effect of *marticaria chamomilla* flowers aqueous extract on cholesterol concentration in broiler chickens

Groups	Cholesterol concentration mg /dl
Treatment 1	130.75 $\pm$ 5.5a
Treatment 2	121 $\pm$ 5.25 a
Control	154.25 $\pm$ 6.1 b

-values are means $\pm$ SEM

-the different letters indicate significant differences ($p < 0.05$) between groups.

- similar letters indicate no significant differences between groups.

3-Hemoglobin concentration:- the data *chamomilla* extract on hemoglobin indicate no significant effect of *marticaria* concentration .table (3)

Table (3) the effect of *marticaria chamomilla* extract on hemoglobin concentration in broiler chickens

Groups	Hb concentration mg /dl
Treatment 1	12.25±0.62 a
Treatment 2	13.5±0.28 a
Control	12.75±0.47 a

-Values are means ±SEM

-the similar letters indicate no significant differences between groups.

4-packed cell volume: the data indicate no significant effect of *marticaria chamomilla* extract on packed cell volume in broiler chickens. Table(4)

Table (4) the effect of *marticaria chamomilla* extract on packed cell volume in broiler chickens

Groups	Packed cell volume %
Treatment 1	29±0.76 a
Treatment 2	32±1 a
Control	27.66±0.69 a

-Values are means±SEM-

-the similar letters indicate no significant differences between groups.

5-Food intake: the data showed no significant effect of *marticaria chamomilla* extract on food intake in broiler chickens. Table(5).

Table(5) the effect of *Marticaria chamomilla* extract on food intake in broiler chickens.

Age in weeks	Food intake in grams		
	Treatment 1	Treatment 2	Control 3
Week 2	205±6.8 a	199±7 a	192±6.5 a
Week 3	232.8±4.5 a	280±5 a	306±5.2 a
Week 4	499±3.4 a	452±4 a	530±4.32 a
Week 5	468±5.5 a	408±6.1 a	404±6.8 a
Week 6	543±3.3 a	629±4.25 a	520±4.3 a
Week 7	715±404 a	687±4.2 a	688.6±5 a

-the values are means ±SEM-

-the similar letters showed no significant differences between groups.

6-Body weight:- Data indicated no significant effect of *Marticaria chamomilla*

aqueous extract on body weight in broiler chickens. Table(6).

Table (6) the effect of *Marticaria chamomilla* extract on body weight in broiler chickens

Age in weeks	Body weight(g)		
	Treatment 1	Treatment 2	Control 3
Week 2	123.2± 1.68 a	120.8±2.38 a	112.2 1.68 a
Week 3	210.4± 5.34 a	213.2± 5.5 a	208 ±6.26 a
Week 4	311.6±5 a	373±6.6 a	316±8.8 a
Week 5	561±2.2 a	577.6±1.4 a	555±1 a
Week 6	888.2±3.5 a	782.2±2.5 a	845.8±3 a
Week 7	1103±5.1 a	1131.6±5.4 a	1169.8±5.4a

- Values are means± SEM

-similar letters indicated no significant differences between groups.

Discussion

1-Glucose concentration: the results showed significant decrease in glucose concentration in treatments groups. (Concentrations of chamomile extracts 50mg /kg, 100mg/kg respectively) compared with the control. This effect was due to antihyperglycemic effect of *Marticaria chamomilla* extract, the mechanisms of blood glucose lowering activity may be to stimulation of peripheral glucose utilization especially in muscle and adipose tissue and/or the restoration of enzyme activity which play apart in the glucose and glycogen metabolism, this accept with results of researchers , they found that full hot water extract of chamomile possessed inhibitory activity of sucrase enzymes, which are responsible for the conversion of sucrose to fructose and glucose; inhibition would reduce the rise in glucose levels(8).Another study demonstrated that daily consumption of chamomile tea with meals could be Potentially useful in the prevention and self-medication of hyperglycemia and diabetic complications (10).

2-Cholesterol concentration:- the results showed significant decrease in cholesterol

concentration in treatments groups, compared with control .this decrease in cholesterol concentrations is due to antioxidants properties of *Marticaria chamomilla* extract. In a study researchers found that the ethanolic extract of *Marticaria chamomilla* inhibit the formation of free radicals and may scavenge the reactive oxygen metabolites through various antioxidants compounds in them (3).In another study *in vivo*, they found that chamazulen, the active ingredient in *Marticaria chamomilla*, effect free radical processes and inhibit lipid peroxidation (4).

In vitro data: Chamazulene affects free radical processes and inhibits lipid peroxidation

in a concentration- and time-dependent manner(14).

3-Hemoglobin concentration and packed cell volume:-the results showed no significant effect of *Marticaria chamomilla* extract on hemoglobin concentration and packed cell volume. It may be has No effect on red blood cell proliferation and circulation.

4-Food intake and body weight: - the results showed no significant effect of *Marticaria chamomilla* extract on body weight. This is due to limited effect of chamomile components on fat storage, in study researchers found limited effect of

chamomile oil on weight of laying hens (13).the results showed no significant effect of *Marticaria chamomilla* extract on food intake, it may be to limited effect of chamomile extract on appetite.

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تأثير المستخلص المائي لأزهار البابونج في بعض الصفات الفسلجية في فروج اللحم

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الخلاصة

أجريت هذه الدراسة على أفراخ فروج اللحم نوع فاو برو لمعرفة تأثير المستخلص المائي لأزهار البابونج في بعض الصفات الفسلجية. استخدمت أفراخ بعمر يوم واحد غذيت على العليقة بصور حرة حتى عمر 7 أسابيع. استخدمت 60 فرخة وكان معدل وزن الجسم 55 غم قسمت إلى ثلاث مجاميع (كل مجموعة تحوي 20 طيراً):-

- 1- **مجموعة المعاملة الأولى:** جرعت المستخلص المائي لأزهار البابونج بتركيز 50 ملغم/كغم من وزن الجسم.
- 2- **مجموعة المعاملة الثانية:** جرعت المستخلص المائي لأزهار البابونج بتركيز 100 ملغم/كغم من وزن الجسم.
- 3- **مجموعة السيطرة:** جرعت الماء المقطر. في نهاية التجربة تم سحب الدم من الوريد العضدي من عشرة طيور في كل مجموعة من المجاميع الثلاث لغرض إجراء الفحوصات الدموية والكيموحيوية.

استخدمت المعايير التالية: تركيز الكلوكوز في مصل الدم و تركيز الكوليستيرول في مصل الدم. نسبة الهيموكلوبين ,حجم خلايا الدم المرصوص ووزن الجسم واستهلاك العلف. أظهرت النتائج وجود قلة معنوية ($p < 0.05$) في تركيز الكلوكوز والكوليستيرول في مصل الدم في مجموعة المعاملة الأولى والثانية مقارنة بمجموعة السيطرة, بينما نسبة الهيموكلوبين وحجم خلايا الدم المرصوص ووزن الجسم واستهلاك العلف.