

**Short Communication****Influence of poly germander (*Teucrium polium*) and watercress (*Nasturtium officinale*) extract on performance, carcass quality and blood metabolites of male broilers****Mostaan Khosravi Manesh<sup>1</sup> Soheila Kazemi<sup>2</sup> and Maryam Asfari<sup>2</sup>**<sup>1</sup>Young Researchers Club, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran; <sup>2</sup>Faculty of Veterinary Medicine, Urmia University, Iran**Abstract**

This experiment was conducted to study effect of poly germander (*Teucrium polium*) and watercress (*Nasturtium officinale*) extracts on performance and serum biochemistry of broilers. Two hundred and forty male Ross broilers (were allotted into 4 diet treatments for 42 days. The birds were fed their standard feed without any addition (control) or with addition of 200 ppm of poly germander extract (T1), 200 ppm watercress extract (T2) or 200 ppm of the combination of both components (T4). No significant change was observed in term of growth parameters and blood biochemistry, however, abdominal fat decreased significantly in the watercress and the combination extracts supplemented groups. The study highlighted the potential of these herbal extracts to improve body performance and carcass quality of broilers.

**Keywords:** Poly germander, Broilers, Carcass, Water-cress, Extract**Introduction**

Due to growing concerns about antibiotics resistance and banning the use of antibiotics as growth promoters in many countries, there is an increasing interest in finding alternatives to antibiotics in poultry production because of some negative effects of these products like microbial resistance (Lee et al., 2003; Osman et al., 2005; Mansoub, 2010). The positive effects of herbal plants on broilers have been reported in many studies. Their antibacterial potential, hypocholesterolemic and growth promoting effects have drawn the scientists' attention (Mansoub, 2010; Mansoub, 2011b). There is a need to find more efficient alternatives or combinations of different alternatives for maintaining health and improving performance of poultry and livestock.

Phytochemical compounds are the groups of feed additives that have been reported to possess a potential for growth enhancement of livestock species due to presence of a number of pharmacologically active

substances (Horton et al., 1991; Osman et al., 2005). These compounds are supposed to enhance feed intake, activate digestive enzymes and stimulate immune function (Lee et al., 2003). Some of medical effects of herbs are related to their secondary metabolites such as phenols, necessary oils and saponins (Horton et al., 1991; Osman et al., 2005). Today, the concern of the researchers is reducing the abdominal fat and increasing the carcass (Abdel-Malak et al., 1995; Abd El-Latif et al., 2002; Lee et al., 2003; Mansoub, 2010; Mansoub, 2011a).

The objective of this work was to evaluate the effect of poly germander poly germander (*Teucrium polium*) and watercress (*Nasturtium officinale*) extracts addition to feed on growth and feed utilization efficiency of broilers.

**Materials and Methods**

A total of 240 male Ross broilers (one day old) were accommodated in 12 pens (each containing 20

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chickens) and then randomly allocated into four diet treatments for a total experimental period of 42 days.

The experimental treatments were:

Control: the group that did not receive any herbal plant oil in the feed shown in Table 1.

T2: had 200 ppm of poly germander extract added to the feed shown in Table 1.

T3: had 200 ppm watercress extract added to the feed shown in Table 1.

T4: had 100 ppm of both poly germander extract+100 ppm water cress extract added to the feed shown in Table 1.

**Table 1: Ingredients and chemical composition of starter and Grower ration based on NRC (1994)**

Ingredients (g/kg)	Starter <sup>1</sup>	Grower
Maize	555	300
Wheat	--	328
Soybean meal	372	302
Soybean oil	31	42
Fish meal	19	--
Limestone	11	--
Oyster shell	--	11
Dicalcium phosphate	5	14
Vitamin-mineral mix <sup>2</sup>	5	5
Methionine	1	1
Sodium chloride	2	2
Vitamin E (mg/kg)	--	100
Zn (mg/kg)	--	50
Chemical composition (g/kg)		
Dry matter	892.2	893.5
Crude protein	222.3	200.7
Fat	62.4	62.9
Fiber	36.1	35.6
Ash	61.7	57.0
Calcium	8.22	8.15
Phosphorus	5.48	5.57
Selenium (mg/kg)	0.53	0.58
Calculated metabolizable energy (MJ/kg)	12.78	12.91

<sup>1</sup> starter diet fed to birds from 0 to 21 days; <sup>2</sup>Provides per kilogram of diet: vitamin A, 9,000 IU; vitamin D3, 2,000, IU; vitamin E, 18 IU; vitamin B1, 1.8 mg; vitamin B2, 6.6 mg B2.; vitamin B3, 10 mg; vitamin B5, 30 mg; vitamin B6, 3.0 mg; vitamin B9, 1 mg; vitamin B12, 1.5 mg; vitamin K3, 2 mg; vitamin H2, 0.01 mg; folic acid, 0.21 mg; nicotinic acid, 0.65 mg; biotin, 0.14 mg; choline chloride, 500 mg; Fe, 50 mg; Mn, 100 mg; Cu, 10 mg; Zn, 85 mg; I, 1 mg; Se, 0.2 mg.

Birds had free access to feed and water during the whole experimental period. Feed intake and chick weight were taken on weekly basis. Feed consumed was recorded daily by the uneaten discarded, and feed conversion ratio (FCR) was calculated (total feed : total gain). At 42 days of age, four birds per replicate were randomly chosen, slaughtered and calculated for muscular, fat and visceral organs as described by (Mansoub, 2011). On 35<sup>th</sup> day of experiment, three chicks were chosen from each group for blood sample collection. In the 42<sup>th</sup> day of experiment and after 12

hours of fasting, blood samples were obtained from brachial vein and centrifuged to get serum. .

### Statistical Analysis

One way analysis of variance was conducted using the Statistical Analyses Software (SAS, 2001) to test the significance of effect of diet treatments on the studied traits. Significant difference between means of the significantly affected traits was tested by Duncan multiple range test.

**Table 2: Feeding performance and carcass cuts of the control and extract treated groups**

	Control	T1	T2	T3	SE
Feed intake (g/d)	81.36	82.86	81.42	82.97	1.59
Body weight gain (g/d)	45.10	46.77	45.19	46.87	1.11
Feed conversion ratio (g feed intake/g body gain)	1.80	1.66	1.68	1.67	0.03
Breast (% of carcass)	31.06	32.68	31.90	33.11	0.11
Abdominal fat (% of carcass)	3.86 <sup>a</sup>	3.75 <sup>a</sup>	3.27 <sup>b</sup>	3.21 <sup>b</sup>	0.10
Liver (% of carcass)	3.50	3.53	2.94	3.52	0.36
Gizzard (% of carcass)	2.30	2.43	2.33	2.89	0.10

T1: 200 ppm of poly germander extract; T2: 200 ppm watercress extract; T3: 200 ppm of both poly germander and watercress herbal plants extracts; Values with different superscripts differ significantly (P<0.05)

**Table 3: Some biochemical parameters of the broiler fed the control and extract treated diets**

	Control	T1	T2	T3	SE
Glucose (mg/dl)	173.11	172.93	172.89	172.79	1.11
Cholesterol (mg/dl)	133.22	134.60	134.21	134.23	1.19
Triglyceride (mg/dl)	41.83	41.30	41.12	40.62	1.33
Low density lipoprotein (mg/dl)	32.14	32.21	32.10	31.141	1.21
High density lipoprotein (mg/dl)	81.21	81.35	80.02	82.40	2.13

T1: 200 ppm of poly germander extract; T2: 200 ppm watercress extract; T3: 200 ppm of both poly germander and watercress herbal plants extracts

### Results and Discussion

The effects of poly germander and water cress extracts on the studied parameters of performance are shown in Table 2. No significant differences were observed between the control and treated groups in feed intake, weight gain and feed conversion ratio. The observed insignificant improvement in the treated groups may be due to the effects of nutritional factors of both herbal plants which have been reported for better performance traits in poultry (Mansoub, 2011a). Yazdankish et al. (2010) and Langhout (2000) showed that these herbal plants could stimulate the digestive system in poultry, improve the function of liver and increase the pancreatic digestive enzymes.

Enhancement of metabolism as a result of supplementation of herbal plant could increase growth rate (Mellor, 2000a&b). However, effects of phytogetic compounds and their active ingredients are not always observed in terms of performance parameters, as they also affect different metabolic pathways and activity of different body systems as reported by Lee et al. (2003) for female broilers. The effects of poly germander and watercress extracts on blood biochemical parameters are presented in Table 3. There was no diet treatment effect on the studied blood biochemical parameters of the broilers. The results of the present experiment indicated that the two herbal plants did not influence the body performance and blood biochemistry of broilers, however, abdominal fat decreased significantly in the treatments of watercress extract (T3) and the combination of poly germander and watercress extracts (T4).

The current study concluded that the two herbal plants poly germander (*Teucrium polium*) and watercress (*Nasturtium officinale*) extracts produce broiler carcasses of low fat thus of high quality. The study also highlighted the potential of the extracts to improve broilers' feed utilization efficiency.

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