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Influence of dietary supplemented Thyme (*Thymus vulgaris* L.) and Pennyroyal (*Mentha Pulegium*)leaves on hematological indices of Japanese quails(*Coturnix coturnix japonica*)

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ABSTRACT

This experiment was conducted to assess the effects of using medical plant Thyme (Thymus) and pennyroyal leaves on hematological indices(hematocrit, hemoglobin, red blood cell, total white blood cell, heterophil, acidophil, monocyte and basophil) of Japanesequails. The birds were divided in to three groups (each group had four replicate and each replicate had 13 female quail); group1: control without medicinal plants supplementation, group2: include pennyroyal (0.75% of total ration), and group3: include Thyme (0.75% of total ration).the experimental period was 5 weeks and all of them have same age (42 day) and they were at the onset of egg production period. Their dietary treatments on basal corn and soybean meal that medical plants (Pennyroyal and Thyme) used on 0 and 0.75 levels. With exception to decreases in heterophil number for group three (fed thyme leaves), there was no any considerable changes for hematological indices. As conclusion, supplementation of thyme or pennyroyal leaves cannot cause any negative effect on hematopoiesis or leukocyte differential numbers in Japanese quail.

Key words: medical plants, hematological parameters, dietary supplementation, Japanese quails.

INTRODUCTION

Phito-pharmaceuticals correspond in a particular way to the demands of production in organic agriculture, thus suitable for the animals in “Bio” farms. The wide use of antibiotics and other chemical compounds have been experienced throughout the last 50 years which have been directed research back to natural antimicrobial products as indispensable resources [1]. Different additives like, enzymes, organic acids, probiotics, prebiotics and phytogenic are used to improve the performance [2]. The current study conducted by Erhan et al. [3] shows biological efficiency of pennyroyal in broiler ration. In their study dietary supplementation of pennyroyal improved feed conversion ratio and lactic acid bacteria count, as well as decreased E. coli count, of the jejunum in broilers. Newly, some medicinal herbs, and their associated essential oils or extracts are being concerned as potentially growth promoters. In other side, the hematological effects on some medicinal plants additive was reported in farm animals [4]. In their study that conducted with thyme extract, it has been shown; this kind of medicinal supplementation didn’t affect hematopoiesis profile of lambs negatively.

Relative experiments on individuals with thyme supplements, had positive results on hematopoietic parameters; in this regards, Hazar and Alpay, [5] had concluded that thyme can improve iron binding capacity of hemoglobin.

The aim of present study was to investigation on dietary inclusion of these two medicinal plants (Thyme and Pennyroyal) on hematopoietic indices in Japanese quails.

MATERIALS AND METHODS

The birds were divided in to four groups (each group had four replicate and each replicate had 13 female quail); group1: control without medicinal plants supplementation, group2: include Mentha Pulegium (0.75% of total mixed ration), group3: include Thyme (0.75% of total mixed ration) and group4: includes both of thyme and pennyroyal supplements (each of them: 0.75% of total mixed ration) .the experimental period was 5 weeks and all of them have same age (42 day) and they were at the onset of egg production period. Their dietary treatments on basal corn and soybean meal that medical plants (Mentha Pulegium and Thyme) used on 0 and 0.75 levels.

The blood samples were taken at day 45 of rearing period and measurement of blood cells were done following hematocrit centrifuge for hematocytometric count and macroscopic counts by light microscope.

The obtained data was analyzed by SAS software Ver.9.1 with general linear procedure, and multiple range Duncan test was applied for detection of possible significant differences between means ($P<0.05$).

RESULTS AND DISCUSSION

Data obtained from hematological analysis are presented as table1 and table2.

Table1. Red blood cell count and relative measures of Japanese quails fed medicinal plants

groups	Supplemented medicinal plants (percent of total ration)	Hematocrit %	Hemoglobin *mg/dl*	RBC $\times 10^6$
1	0% thyme + 0% pennyroyal	49.63	15.54	2.65
2	0% thyme + 0.75% pennyroyal	48.94	15.20	3.11
3	0.75% thyme + 0% pennyroyal	47.69	15.23	3.08
4	0.75% thyme + 0.75% pennyroyal	46.13	15.14	3.03
SEM	-	1.87	0.15	0.22

Table2. Leukocyte counts of Japanese quails fed medicinal plants

groups	Supplemented medicinal plants (percent of total ration)	WBC *no./ml*^{3}	Heterophil *%*	Acidophil *%*	Monocyte *%*	Basophil *%*
1	0% thyme + 0% pennyroyal	18000	37.88^a	62.13	0	0
2	0% thyme + 0.75% pennyroyal	15437.50	23.50^{ab}	60.24	0.75	0
3	0.75% thyme + 0% pennyroyal	20062.50	19^b	80.38	0.25	0.50
4	0.75% thyme + 0.75% pennyroyal	16187.50	24.38^{ab}	76	0.75	0.25
SEM	-	3515.70	3.73	7.32	0.34	0.24

Given the table1, there was no considerable change in RBC or related measures. Also, given the table2, with exception to minor decreases in heterophil numbers for thyme supplemented group, there was no any considerable change for any WBC related measure.

In laying hens, Nobakht et al., [6] had reported that dietary supplementation 0.5% of pennyroyal, 0.05% had adverse effects on egg production performance, although they hadn't any investigation on hematology of experimental birds. In Toghyani et al., [7] study on peppermint (from mentha family), there was no any significant difference between control and peppermint supplemented group for RBC, WBC and relative or subunit measures. Our findings is according to Toghyani et al., [7] report. Also, dietary supplementation of pennyroyal powder in Nobakht et al., [8] was not cause to any significant effect on hematological measures in broiler chicken, when fed group was compared with control. Present findings for pennyroyal, are in agreement with Nobakht et al., [8] in broiler chickens.

As conclusion dietary supplementation of thyme and pennyroyal for 0.75% of total mixed ration don't have considerable negative effect on hematopoietic activity of Japanese quails that it was apparent for broiler chickens due to past published studies.

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