



COMPARING GIT CESTODES AND NEMATODES IN DESI AND BROILER CHICKEN

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ARTICLE INFORMATION

Article History:

Received: 15th September 2018

Accepted: 10th October 2018

Published online: 22nd February 2019

Author's contribution

R.Z.I designed the project A.A performed the experiments A.A analysis the data S.N.A completed these results and L.A submitted the findings.

Key words:

Cestode, nematode, scavenger chicken, broiler chicken, gastrointestinal parasites

ABSTRACT

A study on the prevalence of cestode and nematode parasites in Desi and Broiler chicken was conducted. Total 400 (200 each) birds were examined. The gut samples were collected during May, June, and July. Microscopic examination revealed that 84% and 66% desi chicken acquired the infection with cestode and nematodes respectively. While the prevalence of cestode and nematode in broiler was found 30.5% and 23% respectively. The prevailing percentage of cestode species in desi and broiler chicken were 58 and 17; 5 and 6; 15 and 6.5; 4 and 1, and 4 and 0, with *Raillietina tetragona*, *Raillietina cesticillus*, *Raillietina Echinobothrida*, *Amoebotaenia cuneata*, and *Choanotaenia infundibulum* respectively. The prevailing percentage of nematode species in desi and broiler chicken were 40 and 9, and 26 and 14, with *Ascaridia galli* and *Subulura brumpti* respectively. Comparative study revealed that the prevailing percentage of cestode and nematode was significantly higher ($P < 0.05$) in desi breed as compared to the broiler. The highest prevailing percentage of cestode was recorded during July and May in desi and broiler respectively. The prevalence of nematode during the month of July was found to be higher than corresponding months of study in both breeds of chicken.

1. INTRODUCTION

Poultry parasites always put forth the negative impact on the health and production of the bird. They may not only be the partner in host's food but also decrease food utilization, resulted in the loss of appetite leads to a reduction in food intake and protein synthesis [1, 2,3,4]. There are several factors involved in the decreased production and increased mortality in chicken. Predators, diseases, parasites, mismanagement and lack of nutritional feeding, resulting in the low production with high mortality in scavenger chicken [5,6,7,8,9]. Both the ecto- and endo-parasites are

the major causes to hamper the poultry production, especially in the free-range management of scavenger chicken [10,11,12,13]. Although the prevalence of parasitic infections has been greatly reduced in the commercial production system, mostly due to improved housing, hygiene, and management operation [14] but in free-range poultry, it is still a great problem throughout the world [14,15,16,17,18]. The poultry parasites, including helminths causing heavy economic losses to the poultry industry and could be controlled by improving the management practices including housing and hygiene to reduce the losses [14,15,19].

Helminths affect not only the health but also lower the productivity of the poultry. They cause many hazards to the poultry like retarded growth, poor weight gains, decreased egg production, obstruction in the intestine, diarrhea, deprived body resistance and may even cause death in severe infection [4,20,21]. The helminth

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parasites of poultry are commonly divided into three main groups, i.e., *nematodes*, *cestodes*, and *trematodes*. *Cestodes* (tapeworms) belong to the phylum Platyhelminthes, class Cestoda. The cestodes and nematodes are the most common poultry parasites affect the poultry health resulting significant decrease in egg and meat production [22,23] mentioned more than 1400 tapeworm species in scavenger poultry and wild birds. Young birds are more severely affected than older ones resulted in reduced efficiency and slower growth [17]. *Nematodes* are also the most common and important helminths with 50 species in poultry. Of these, the majority causes pathological damage to the host. Nematodes belong to the phylum Nematelminthes, class Nematoda. The *nematodes* of poultry are parasitic, unsegmented worms [17]. The aim of this study was to collect the information on the prevalence of the various species of *cestode* and *nematode* found in desi (scavenger) and broiler (commercial chickens) in and around of Tando Mohammad Khan.

2. MATERIALS AND METHODS

2.1 Collection and investigation of gut samples

Four hundred gut samples of desi (scavenger) and commercial broilers (200 each) were examined. The guts of broiler chicken were collected from various poultry meat shops while desi chickens were purchased from Tando Mohammad Khan and surrounding villages, during the months of May to July. All the desi birds were slaughtered and whole the digestive tracts (gut) were removed carefully. Each gut was placed in a tray, incised with a pair of scissors in a longitudinal section from the crop to the cloacae, and washed out thoroughly in a 90µm aperture test sieve for recovering the smaller helminths. The investigation was done very carefully with a magnifying glass and large helminths were picked up from the sieve with forceps, the residual contents were examined under a stereomicroscope at 40 times magnification, and all the smaller parasites were collected and transferred to a normal saline solution. Several washings were given to intestinal material before the final examination. The incised intestines were also immersed in the warm saline solution for the release of tapeworms and their scolex.

2.2 Preservation and Identification

All the helminths were counted and preserved in a glycerol-alcohol mixture (95 parts 70% ethyl alcohol and 5 parts pure glycerin). For permanent storage, the parasites were washed in fresh water for 5-6 times and passed gradually through 30%, 50% and 70% alcohol for 10 minutes. For identification, the parasites were mounted in drops of lactic acid (clearing agent). Examination and identification were carried out under a binocular electric microscope using the helminthological keys described [17,24].

2.3 Statistical Analysis

The collected data were analyzed with the help of SPSS 10 software.

3. RESULTS AND DISCUSSION

The prevalence of *cestodes* and *nematodes* together with their respective species are shown in Table 1 and Table 2 respectively. Out of 400 examined birds, 229 (57.25%) and 178 (44.5%) guts were found positive for *cestode* and *nematode* infection respectively. Out of 200 examined guts of desi chicken, 168 (84%) were found positive with *cestode* species out of which 116 (58%), 10 (5%), 30 (15%), 8 (4%) and 4 (2%) birds had infection with *Raillietina tetragona*, *Raillietina cesticillus*, *Raillietina Echinobothrida*, *Amoebotaenia cuneata*, and *Choanotaenia infundibulum* respectively. While out of 200 examined guts of broiler chicken 61 (30.5%) were found positive with *cestode* species that 34 (17%), 12 (6%), 13 (6.5%) and 2 (1%) birds had infection with *Raillietina tetragona*, *Raillietina cesticillus*, *Raillietina Echinobothrida*, and *Amoebotaenia cuneata* respectively.

It is reported 84.6% and 84.2% *cestode* prevalence in desi chicken respectively [25,26]. Rasool [25] also found a 30.6% *cestode* prevalence in farm chicken. These findings agree with the present findings. Hussain [27] findings are higher (98%) while Bano et al. [28] and Khan et al. [29] (44%) are lower when compared with the present findings of *cestode* in desi breed. Rashid and Moeed [30] found a 3.2% prevalence of *cestode* in broiler at Lahore while and Sayyed et al., [31] reported 20.25% in layers. Hussain [25] and Rasool [27] found the prevalence percentage of *Raillietina tetragona* (5 & 62),

Raillietina cesticillus (0 & 20.66), *Raillietina Echinobothrida* (28 & 7.33), *Amoebotaenia cuneata* (0 & 2.66) and *Choanotaenia infundibulum* (7 & 12.66) respectively. The differences may be attributed due to the availability of the intermediate host, hygienic conditions and climate of the area.

The prevalence of *nematode* in desi and broiler chicken was found 132 (66%) and 46 (32%) respectively. The species-wise study revealed that 80 (40%) and 52 (26%) guts of desi while 18 (9%) and 28 (14%) guts of broiler chicken were infected with *Ascaridia galli* and *Subulura brumpti* respectively. Zada *et al.* [32] reported 25% and 17.64% prevalence with *A.galli* in desi and broiler chickens of district Mardan respectively which are not in agreement with present findings. The finding of in desi chicken (66.6%) is near to present finding while the prevalence in farm chicken (22.6%) is not in agreement with present investigation [25]. 23.64% and 17.64% nematodes in desi chicken of Iran and India respectively [33,34]. While [26,28,29] found 77.6, 6.7 and 40 percent *nematodes* in chicken respectively. The variation in the prevalence rates reported can be ascribed to variation in prevalence of the intermediate host, location, management, and climate of the different areas.

Comparative study revealed that the prevailing percentages of *cestode* and *nematode* were significantly higher ($P < 0.05$) in desi chicken as compared to broiler (Fig.1). In the rural poultry production, the birds are moved freely in and around the houses to take the feed from the soil, where may get the infected stages of parasites [14,15,24,35]. The current practice in many countries of marketing broiler chickens between the fifth and seventh week of age should theoretically result in a decrease in the frequency of helminth infections [36].

4. Month-wise investigation revealed that the prevalence of *cestode* in May, June, and July was found to be 50 (25%) and 25 (12.5%), 56 (28%) and 17 (8.5%), and 62 (31%) and 19 (9.5%) in desi and broiler chicken respectively (Table-3). The highest prevalence rate of *cestode* was recorded during the month of July and May in desi and broiler chicken respectively (Fig. 2). While a higher prevalence rate of *nematode* was recorded during the month of July in both desi and broiler chicken (Fig. 3). It was

attributed because of more propagation of available intermediate host with suitable environment and temperature.

CONCLUSION

It could be concluded that in the studied area, both desi and broiler chickens were infected to various species of *cestode* and *nematode* parasites infection. The infection rate in desi was found to be higher than broilers. The prevalence of *Raillietina tetragona* was higher than other species of *cestodes*.

5. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interest regarding publication of this article.

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Table 1: Prevelance of cestode parasite in desi and broiler chicken

Chicken	No. of birds examined	No. (%) of birds infected					Total (a+b+c+d+e)	%
		a	b	c	d	e		
Desi	200	116 (58)	10 (5)	30 (15)	8 (4)	4 (2)	168	84.0
Broiler	200	34(17)	12(6)	13(6.5)	2(1)	0(0)	61	30.5
Total	400	150(37.5)	22 (5.5)	43(10.75)	10(2.5)	4(2)	229	57.25

a: *Raillietina tetragona*, b: *Raillietina cesticillus*, c: *Raillietina Echinobothrida*, d: *Amoebotaenia cuneata*, e: *Choanotaenia infundibulum*

Table 2 Prevalence of nematode parasite in desi and broiler chicken

Chicken	No. of birds examined	No. (%) of birds infected		Total (a+b+c+d+e)	%
		a	b		
Desi	200	80 (40)	52 (26)	132	66
Broiler	200	18(9)	28 (14)	46	23
Total	400	98(24.5)	80 (20)	178	44.5

a: *Ascaridia galli*, b: *Subulura brumpti*

Table 3 Month wise prevalence of cestode and nematode parasites in desi and broiler chicken

Month	No. of guts examined		No. (%) of gutsinfected			
			Desi		Broiler	
	desi	broiler	cestodes	nematodes	cestodes	nematodes
May	67	67	50 (25)	45 (22.5)	25 (12.5)	12 (6)
June	67	67	56 (28)	37 (18.5)	17 (8.5)	15 (7.5)
July	66	66	62 (31)	50 (25)	19 (9.5)	19 (9.5)
Total	200	200	168 (84)	132 (66)	61 (30.5)	46 (23)

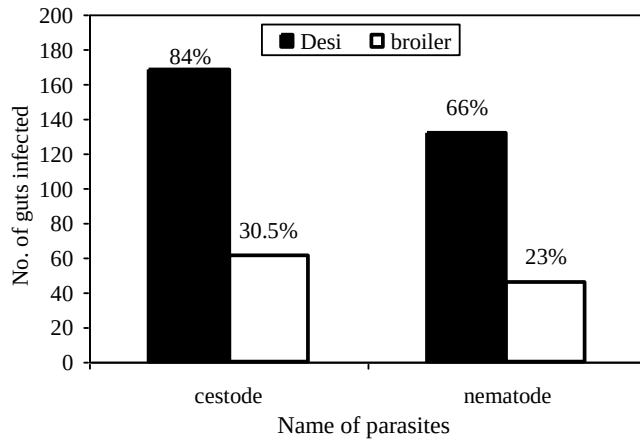


Fig. 1 Comparison of *cestode* and *nematode* prevalence in desi and broiler chicken

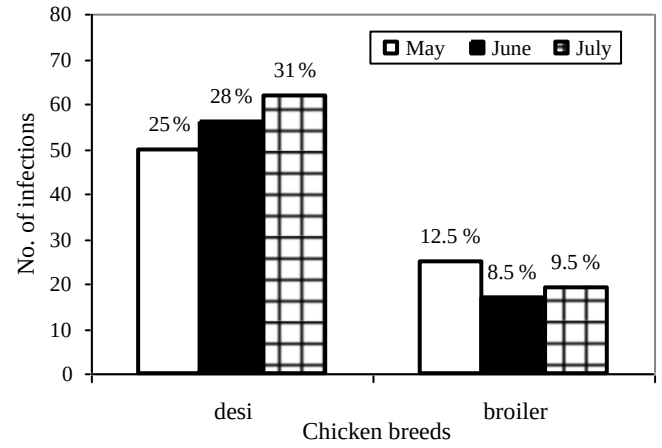


Fig. 2 Month-wise distribution of *cestodes* in desi and broiler chicken

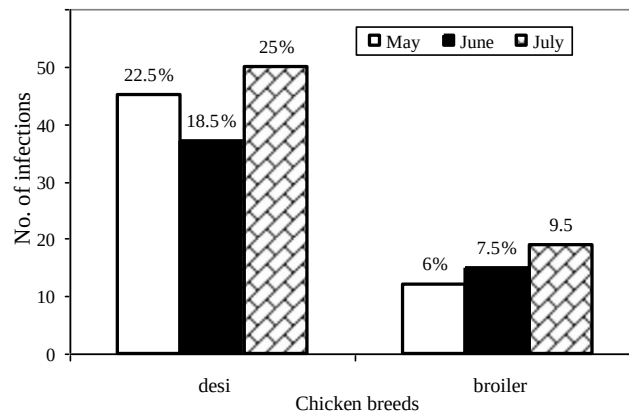


Fig. 3 Month-wise distribution of *nematodes* in desi and broiler chicken