

## Studies on the prevalence of helminthic infection in Broiler Poultry Birds from Marathwada Region, (MS) India

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### ABSTRACT

The present communication deals with the study of prevalence of intestinal helminthic infection in broiler poultry birds from different parts of Marathwada region, Maharashtra state India. The study was conducted during annual cycle June 2011 to May 2012 from different sampling station and different season to estimate the prevalence of helminthic infection. For this study annually 298 broiler poultry birds were randomly selected from small, medium and large poultry farms from different part of Marathwada region under various management systems and different season. Simple salt floatation methods were employed for examination of helminthic infection. After examined the intestine of the birds the overall prevalence found 154 (51.67%) during the annual cycle. The seasonal prevalence percentage of helminthic infection was highest during summer followed by rainy and lowest during winter season and the value were found (60.24%), (53.54%) and (40.78%) respectively. The considerable difference was found in the prevalence of helminthic infection found in different season. The average helminthic infection of parasite found in the broiler poultry birds 48 (16.10%) and 70 (23.48%) were cestode and nematode respectively while the rest 36 (12.08%) were mixed infestations. It was found that the percentage of prevalence of cestode (Summer: 19.10%), (Rainy: 16.26%), (Winter: 12.58%), nematode (Summer: 26.66%), (Rainy: 25.60%), (Winter: 17.89%) and mixed infection (Summer: 14.47%), (Rainy: 11.67%), (Winter: 10.31%) was highest during summer followed by rainy and lowest during winter season. The major helminthic infection of parasites was found in the broiler poultry birds include *Raillietina* and *Ascaridia spp.* the values are (19.62%) and (26.21%) respectively. The study indicated that helminthic infections are highly prevalent in broiler poultry birds in the study area. Therefore, sustainable ways of controlling these parasites and further studies on helminth infection in broiler poultry birds need to be designed for improved poultry meat production.

**KEYWORDS:** Broiler poultry birds, Helminthic infection, Marathwada, Prevalence.

### INTRODUCTION

India recorded the fastest growth rate in poultry meat production during 1985-95 with a growth rate about 18% per annum which perhaps, no other country or agro-industry in the world has recorded, during that period. At present more than 400 million broiler chicks are produced annually.

Intensive rising of poultry in commercial farms inevitably exposes flock to the various diseases which causes mortality and loss to the farmers. Diseased birds can also be hazardous to the human health; there may be possibilities of damage to the human body due to intake of diseased birds. In India, huge loss of birds due to disease is being faced by farmers due to management related problems. Poultry carry heavy infection of varied types of parasites, i. e. helminth, protozoan's, viruses, and arthropods etc. Intestinal helminth infection has a serious impact on poultry health, productivity, quality and quantity of meat.

Helminth parasites of poultry birds are commonly divided into three main groups; cestode, nematode and trematode. The cestodes of significant importance are of the two genera *Raillietina* and *Hymenolepsis*. Nematode constitute the most important group of helminth parasites of poultry both in number of species and the extent of damage they cause; the main genera include *Ascaridia*, *Heterakis* and *Capillaria* (Matur *et al.*, 2010).

The prevalence and intensity of helminth infections may be influenced by several factors, such as climatic conditions (temperature and humidity) may alter the population dynamics of the parasites, resulting in dramatic changes in the prevalence and intensity of helminthic infections (Magwisha *et al.*, 2002). Many insects that may act as vectors for helminths are also favoured by high temperatures and to some extent humidity.

These factors may explain the wide range and distribution of cestode and nematode species in poultry birds, especially during the tropical rainy season (Dube *et al.*, 2010). Hence considering the economic importance of the diseases caused by helminthic infection in broiler poultry birds which interns affect on total production causing high economic loss to the farmers as well as Nation too. Keeping in view the severity of the helminthic infection a systematic work has been undertaken to determine the overall and seasonal prevalence of the helminthic infection and identify the common helminth parasites in broiler poultry birds from Marathwada region (M.S.) India.

### MATERIALS AND METHODS

The data for prevalence of the intestinal helminthic infection is collected from broiler poultry birds procured from different parts of Marathwada region (M.S.) India. The study was conducted during the annual cycle June 2011 to May 2012 from different sampling station. These samples were collected during each season of the annual cycle to estimate the prevalence of helminthic infection. From different part of Marathwada region the samples were obtained from small, medium and large poultry farms under managed and unmanaged conditions. The study area included different part of Marathwada region there is a rainy season from June to September and a dry (winter and summer) season from October to May. For the present study 298 broiler poultry birds were randomly selected in all season with more or less periodicity, under various management systems. The intestines of the broiler poultry birds were brought to the laboratory for examination. The intestine was cut opened and simple salt flotation method was used and observes carefully for helminthic infection. The helminth parasites were collected, fixed in fixatives further processed for taxonomic study and their identification is carried out with the help of helminthological key described by (Souls by 1982). The data obtained is tabulated and analysed to show the prevalence of helminthic infection in different months and season from different part of study area. The detailed studies were undertaken with a view to find out the data of prevalence of helminthic infection in broiler poultry birds. The following formula is used to analyse the overall and seasonal prevalence of helminthic infection.

$$\text{Prevalence} = (\text{No. of birds Infected} / \text{No. of birds examined}) \times 100$$

### RESULTS AND DISCUSSION

The overall and seasonal percentage of prevalence of helminthic infection in broiler poultry birds from Marathwada region during the annual cycle June 2011 to May 2012 is shown in Table 1. During the study period total 298 broiler poultry birds were randomly selected in all season more or less periodicity procured from different part of Marathwada region (M.S.) India. These birds procured from small, medium and large poultry farms under managed and unmanaged conditions, autopsied them and the intestines were brought to the laboratory and examined, out of 298 broiler poultry birds, 154 (51.67%) were positive for helminthic infection, showing the presence of helminth parasites in the intestine. Considering only the helminthic infected broiler poultry birds (154), A considerable difference was found in the prevalence of helminthic infection among different season, with the highest value found in summer season (60.24%) followed by rainy season (53.54%), and lowest during winter season (40.78%). The broiler poultry birds were found to have 48 (16.10%) with cestode infection whereas 70 (23.48%) with nematode infection and 36 (12.08%) with mixed infection. There is no intestinal trematode were detected. According to the present study the survey conducted only on the prevalence of cestode and nematode particularly *Raillietina* and *Ascaridia* species respectively. It was found that the percentage of prevalence of cestode (summer: 19.10%, Rainy: 16.26% and winter: 12.58%), nematode (summer: 26.66%, Rainy: 25.60% and winter: 17.89%) and mixed infection (summer: 14.47%, rainy: 11.67% and winter: 10.31%) was highest during summer followed by rainy and lowest during winter season (Table 1).

The overall and seasonal prevalence percentage of identified helminth parasites found in broiler poultry birds during the study period is presented in Table 2. The major helminthic infection of parasites was observed in the broiler poultry birds include *Raillietina* and *Ascaridia spp.* The overall prevalence percentage of these species are (19.62%) and (26.21%) respectively.

The seasonal prevalence percentage of *Raillietina spp.* (Summer 24.76, Rainy 18.36 and Winter 15.75) and *Ascaridia spp.*

**Table 1: Overall prevalence number and percentage of helminthic infection in broiler poultry birds from Marathwada region during the annual cycle 2011-2012.**

Season	Months	No. of birds examined	No. and % of helminthic infected birds	Seasonal % of helminthic infection	No. and % of birds infected with Cestode	Seasonal % of cestode infection	No. and % of birds infected with Nematode	Seasonal % of nematode infection	No. and % of birds with Mixed infection	Seasonal % of mixed infection
Rainy	June	20	12 (60.00)	53.54	3 (15.00)	16.26	6 (30.00)	25.60	3 (15.00)	11.67
	July	23	12 (52.17)		4 (17.39)		5 (21.73)		3 (13.04)	
	Aug.	25	13 (52.00)		4 (16.00)		6 (24.00)		3 (12.00)	
	Sep.	30	15 (50.00)		5 (16.66)		8 (26.66)		2 (6.66)	
Winter	Oct.	22	8 (36.36)	40.78	3 (13.63)	12.58	4 (18.18)	17.89	1 (4.54)	10.31
	Nov.	23	8 (34.78)		2 (8.69)		4 (17.39)		2 (8.69)	
	Dec.	25	11 (44.00)		3 (12.00)		5 (20.00)		3 (12.00)	
	Jan.	25	12 (48.00)		4 (16.00)		4 (16.00)		4 (16.00)	
Summer	Feb.	29	17 (58.62)	60.24	5 (17.24)	19.10	8 (27.58)	26.66	4 (13.79)	14.47
	Mar.	28	16 (57.14)		6 (21.42)		7 (25.00)		3 (10.71)	
	April	23	15 (65.21)		5 (21.73)		6 (26.08)		4 (17.39)	
	May	25	15 (60.00)		4 (16.00)		7 (28.00)		4 (16.00)	
Total		298	154 (51.67)		48 (16.10)		70 (23.48)		36 (12.08)	
Mean				51.52		15.98		23.38		12.15

**Table 2: Species wise prevalence of helminth parasites.**

Season	No. of birds examined.	HelminthSpecies	
		No. and % of birds infected with <i>Raillietina spp.</i>	No. and % of birds infected with <i>Ascaridia spp.</i>
Rainy	98	18 (18.36)	25 (25.51)
Winter	95	15 (15.75)	17 (17.89)
Summer	105	26 (24.76)	37 (35.23)
Mean % of infected birds.	Total 298	19.62	26.21

(Summer 35.23, Rainy 25.51 and Winter 17.89) was higher during summer followed by rainy and lowest during the winter season.

In the present study the prevalence percentage of helminthic infection are found in broiler poultry birds but their findings are correlated with different types of poultry birds. The present study revealed an overall prevalence of helminthic infection 51.67 % in broiler poultry birds in Marathwada region. This findings are more or less similar to the report of the other workers who reported the prevalence range in between 40.00% to 60.00% such as 53.00 % and 41.4 % (Maturet *et al.*, 2010) and (Tesaheywet Z *et al.*, 2012) respectively, and found higher than the report of 10.5 % in Trinidad (Baboolal *et al.*, 2012), where as this finding are lower than the report of 90.9% in India (Yadav and Tandon, 1991), and reports from other

countries such as Ethiopia, 91% and 89.5 % (Eshetu *et al.*, 2001) and (Heyradin Hussien *et al.*, 2012) respectively, Morocco, 89.9% (Hassouni and Belghyti, 2006), Kenya, 90.78 % and 93.3% (Irungu *et al.*, 2004) and (Mungube *et al.*, 2007) respectively, Nigeria, 87.7% (Yoriyo *et al.*, 2008) , Iran, 96% (Eslami *et al.*, 2009), Jordan, 91.6% (Hamad H, 2013). The intensity of prevalence of helminthic infection by the parasites varied from different region and countries. The probable reason for such type of difference found in the prevalence of helminthic infection might be due to the management related differences and some differences related to the environmental factors. Also this could be due to difference in the season of conducting these studies, availability of intermediate hosts, individual host resistance and ecological parameters.

The present study also indicates that among the helminth infected broiler poultry birds, overall infection with cestode was found in 48 (16.10 %), whereas, nematode infection was in 70 (23.48 %), with 36 (12.08 %) birds showing mixed infection, both cestode and nematode in their intestines. The present study showed that the prevalence of nematode is higher than cestode and mixed infection. The higher prevalence of nematode as compare to cestode has been reported in commercial layers in Pakistan (Sayyed *et al.*, 2000), and (Hamad H ,2013) also reported the difference in prevalence rate of cestode and nematode between 16.00% and 33.00% respectively in indigenous chickens in Jordanian villages, this value more or less similar to the present study, whereas (4.1% and 5.5%) cestode and nematode respectively reported in different part of Trinidad (Baboolal *et al.*, 2012) while (Tesfaheywet Z *et al.*, 2012) reported (1.56% and 19.1%) cestode and nematode respectively in south-eastern Ethiopia this value also suggest that the prevalence of nematode is higher than cestode but the values are very low as compare to the present study.

The present study disagree with the report of (Ashenafi and Eshetu, 2004) who documented prevalence of cestode and nematode of (86.32%, 75.79%) respectively, whereas (Heyradin Hussien *et al.*, 2012) also reported the prevalence of cestode and nematode 83.00% and 58.00% respectively, which is higher than the result of the present study, this difference may be due to the indoor management and intermediate hosts availability around the farms in the present study area. No trematode infection was found in this study which is similar to (Hamad H, 2013). This might be due to the absence of the necessary intermediate host around the farms (Magwisha *et al.*, 2002)

The present study also indicates that the percentage of prevalence of helminthic infection related to season, particularly cestode and nematode and the helminth species *Raillietina* and *Ascaridia* was highest during summer followed by rainy and lowest during winter season. These findings are more or less similar to the findings of (Shahin A.M. *et al.*, 2011) who reported the highest incidence of cestode during summer, atum and lowest in winter and spring season. The probable reason of the changes occurred during the season is that; Many insect that may act as vectors for helminthic infection are also favoured by high temperature and to some extent of humidity.

These factors may explain the wide range and distribution of cestode and nematode species in poultry, especially during the tropical rainy season. (Permin *et al.*, 1997, Horning *et al.*, 2003).

The prevalence of helminth parasite species of cestode recorded during the study was *Raillietina spp.* with the prevalence of (19.62 %) this findings are more or less similar to the workers (Tesfaheywet Z *et al.*, 2012) and (Eshetu *et al.*, 2001) in Ethiopia they reported the prevalence of *Raillietina spp.* 22.4% and 25.84% respectively. This finding disagree with the workers who reported the higher prevalence of *Raillietina spp.* 67.2% in Arkansas (Wilson *et al.*, 1994), 63.7% in Ethiopia (Heyradin Hussien *et al.*, 2012), 58.00% in Iran (Eslami *et al.*, 2009), 47.53 in Kenya (Irungu *et al.*, 2004), also (Baboolal *et al.*, 2012) reported very low prevalence of 2.3% in Trinidad as compare to the present study.

The helminth parasite species of nematode recorded from the study was *Ascaridia spp.* with the prevalence of 26.21%. which is 35.58% in Central Ethiopia (Eshetu *et al.*, 2001); 25.7% from Pakistan (Sayyed *et al.*, 2000); 25.63% from Kenya (Kaingu *et al.*, 2010); 75.6% in Palestine (Rayyan and Al-Hindi., 2010) ,37.3% in Arkansas (Wilson *et al.* 1994) ,56.00 % in Iran (Eslami *et al.* 2009) , 32.3% in Ethiopia (Heyradin Hussien *et al.*, 2012), 38.00% in Ethiopia (Tesfaheyw *et al.*, 2012), 10.3% in Kenya (Irungu *et al.*, 2004), 5.8% in Trinidad (Baboolal *et al.*, 2012) have been reported for *A. galli*. This result strongly suggested that *A. galli* is the commonest and most important helminth infection of poultry. Infestation with *A. galli* causes reduction in the growth rate and weight loss, which may be related to damage to the intestinal mucosa. *A. galli* significantly affects the health of chickens by sharing the feed consumed by the host, thus causing stunted growth and reduced egg and meat production (Eshetu *et al.*, 2001; Ashenafi and Eshetu, 2004).

The present study revealed that helminthic infection is commonly found in unmanaged condition broiler poultry birds. The most common cestode and nematode species in broiler poultry birds are *Raillietina spp.* and *Ascaridia spp.* The prevalence of helminthic infection in relation to season was found higher in summer than the rainy and winter season. Among the species, *Ascaridia galli* is most prevalent parasite affecting the health of broiler poultry birds.

This study indicated that helminthic infection particularly cestode and nematode is highly prevalent in this region. Therefore sustainable ways for controlling the helminthic infection and further studies on helminth parasite in broiler poultry birds need to be designed for improvement of poultry egg and meat production.

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