

Research Paper

A Survey on prevalence of Helminth infection in Desi poultry birds from Marathwada region of Maharashtra (India)

Naphade S.T.

Department of Zoology, Yeshwantrao Chavan Arts, Commerce and Science College, Sillod, Aurangabad (M.S.) INDIA

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Abstract

The present research work deals with the study of survey on the prevalence of helminth infection in desi poultry birds from different parts of Marathwada region, Maharashtra state India. The study was conducted from June 2011 to May 2012 from different sampling station and different season to estimate the prevalence of helminth infection. For this study 317 desi poultry birds were randomly selected from different part of Marathwada region in different season. A Simple salt floatation method was employed for examination of helminth infection. After examined the intestine of the birds the overall prevalence found 239 (75.40%) during the study period. The percentage of prevalence of helminth infection related to season was highest during summer (83.96%), followed by rainy (77.66%) and lowest during winter (64.81%). The considerable difference was found in the prevalence of helminth infection in different season. The present study is concentrated only on the prevalence of cestode and nematode particularly Raillietina and Ascaridia species respectively. The average helminth infection of cestode parasite was 72 (22.71%) and nematode was 114 (35.96%) found in the desi poultry birds, while the rest 53 (16.71%) were mixed infestations. It was found that the prevalence percentage of cestode (Summer: 26.38%, Rainy: 22.32%, Winter: 19.42%), nematode (Summer: 39.63%, Rainy: 37.87%, Winter: 30.61%) and mixed infection (Summer: 17.91%, Rainy: 17.5%, Winter: 14.79%) was highest during summer followed by rainy and lowest during winter season. The major helminth infection of parasites includes Raillietina (21.01%) and Ascaridia spp. (32.78%). This study shows that helminth infection is found more in desi poultry birds in the study area. Therefore, improved poultry management practices for controlling these parasites and further studies on control strategies of helminth infection in desi poultry birds need to be advised for improved poultry meat production.

Keywords: Desi Poultry birds, Helminth 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. helminths, 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 cestode of significant importance is of the two genera *Railleitina* 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* ^[1].

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 helminth infections ^[2]. 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 ^[3].

Hence considering the economic importance of the diseases caused by helminth infection in desi 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 helminth infection a systematic work has been undertaken to determine the overall and seasonal prevalence of the helminth infection and identify the common helminth parasites in desi poultry birds from Marathwada region (M.S.) India.

Materials and Methods

The data for prevalence of the intestinal helminth infection is collected from desi 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 helminth infection. From different part of Marathwada region the samples were obtained from small household poultry farms and market of poultry. The study area included different part of Marathwada region there is rainy season from June to September and dry (winter and summer) season from October to May. For the present study 317 desi poultry birds were randomly selected in all season with more or less periodicity, under household management systems. The intestine of the desi 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 helminth 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 ^[4]. The data obtained from the survey period is tabulated and analysed to show the prevalence of helminth 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 helminth infection in desi poultry birds. The following formula is used to analyse the overall and seasonal prevalence of helminth infection.

Prevalence = (No. of birds Infected / No. of birds examined) x 100

Results and Discussion

The overall and seasonal percentage of prevalence of helminth infection in desi poultry birds from Marathwada region during the annual cycle June 2011 to May 2012 is shown in Table 1. During the study period total 317 desi 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 household poultry farms and market of poultry, autopsied them and the intestine were brought to the laboratory and examined, out of 317 desi poultry birds, 239 (75.40%) were positive for helminth infection, showing the presence of helminth parasites in the intestine. Considering only the helminth infected desi poultry birds (239), A considerable difference was found in the prevalence of helminth infection among different season, with the highest value found in summer (83.96%) followed by rainy (77.66%), and lowest during winter season (64.81%). The desi poultry birds were found to have 72 (22.71%) with cestode infection whereas 114 (35.96%) with nematode infection and 53 (16.71%) with mixed infection. There is no intestinal trematode were detected.

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

Season	Months	No. of birds examined.	No. and % of parasitic helminth infected birds.	Seasonal % of parasitic helminth.	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	26	21 (80.76)		6 (23.07)		10 (38.46)		5 (19.23)	
	July	25	20 (80)	77.66	5 (20)	22.32	10 (40.00)	37.87	5 (20.00)	17.5
	August	25	19 (76)		6 (24)		9 (36.00)		4 (16.00)	
	September	27	20 (74.07)		6 (22.22)		10 (37.03)		4 (14.81)	
Winter	October	28	19 (67.85)		6 (21.42)		8 (28.57)		5 (17.85)	
	November	27	16 (59.25)	64.81	5 (18.51)	19.42	8 (29.62)	30.61	3 (11.11)	14.79
	December	27	17 (62.96)		5 (18.51)		8 (29.62)		4 (14.81)	
	January	26	18 (69.23)		5 (19.23)		9 (34.61)		4 (15.38)	
Summer	February	27	22 (81.48)		7 (25.92)		10 (37.03)		5 (18.51)	
	March	27	24 (88.88)	83.96	8 (29.62)	26.38	11 (40.74)	39.63	5 (18.51)	17.91
	April	26	21 (80.76)		6 (23.07)		10 (38.46)		5 (19.23)	
	May	26	22 (84.61)		7 (26.92)		11 (42.30)		4 (15.38)	
Total		317	239 (75.40)		72 (22.71)		114 (35.96)		53 (16.71)	

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: 26.38%, Rainy: 22.32% and Winter: 19.42%), nematode (Summer: 39.63%, Rainy: 37.87% and Winter: 30.61%) and mixed infection (Summer: 17.91%, Rainy: 17.5% and Winter: 14.79%) (Table 1). The major helminth infection of parasites was observed in the desi poultry birds include *Raillietina* spp. (21.01%) and *Ascaridia* spp. (32.78%). The overall and seasonal prevalence percentage of helminth infection was highest during summer followed by rainy and lowest during the winter season.

In the present study the prevalence percentage of helminth infection are found in desi poultry birds but their findings are correlated with different types of poultry birds. The present study revealed an overall prevalence of helminth infection 75.40 % in desi poultry birds in Marathwada region. These findings are more or less similar to the report of 75.8 % in Quetta, Pakistan^[5]. Whereas the findings of the present study is higher than the report of 63.00 % in Parbhani^[6], 53.00 % in Nigeria^[1], 41.4% Ethiopia^[7], and 10.5 % in Trinidad^[8]. These findings are lower than the report of 90.9% in India^[9], and reports from other countries such as Ethiopia, 91%^[10], 89.5 %^[11], Morocco, 89.9%^[12], Kenya, 90.78 %^[13], 93.3%^[14], Nigeria, 87.7%^[15], Iran, 96%^[16]. Jordan, 91.6%^[17]. The intensity of prevalence of helminth infection by the parasites varied from different region and countries. The probable reason for such type of difference found in the prevalence of helminth infection might be due to the management and environmental related 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 desi poultry birds, overall infection with cestode was found in 72 (22.71%), whereas, nematode infection was in 114 (35.96%), with 53 (16.71%) 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^[18], in Jordan^[17] also reported the difference in prevalence rate of cestode and nematode between 16.00% and 33.00% respectively in indigenous chickens in Jordanian villages, these values are more or less similar to the present study, whereas cestode (4.1%) and nematode (5.5%) in different part of Trinidad^[8]. while cestode (1.56%)^[7] and nematode (19.1%)^[7] in south eastern Ethiopia these values 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 disagrees with the report of Ashenafi *et al.*^[19] who documented prevalence of cestode (86.32 %) and nematode (75.79%), whereas In Ethiopia^[11]. 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 possibility of exposure to suitable less number of intermediate hosts availability around the farms and differences in the intensity of care between the farms in the present study area. No trematode infection was found in this study which is similar to report of Jordan^[17]. This might be due to the absence of the necessary intermediate host around the farms^[2].

The present study also indicates that the percentage of prevalence of helminth 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 *et al.*^[20]. Who reported the highest incidence of cestode during summer, autumn and lowest in winter and spring season. The probable reason of the changes occurred during the season may be due to different geographical area, study period and seasonal changes due to temperature and humidity also, Many insect that may act as vectors for helminth 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.^[21, 22]

The prevalence of helminth parasite species of cestode recorded during the study was *Raillietina* spp. with the prevalence of 21.01 % these findings are more or less similar to the workers in Ethiopia^[7, 10] they reported the prevalence of *Raillietina* spp. 22.4% and 25.84% respectively. These finding disagree with the workers who reported the higher prevalence of *Raillietina* spp. 67.2% in Arkansas^[23], 63.7% in Ethiopia^[11], 58.00% in Iran^[16], 47.53 In Kenya^[13]. Also Baboolal *et al.*^[8] 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 32.78%, which is more or less similar to the report of 32.3% in Ethiopia^[11], 35.58% in Central Ethiopia^[10], 37.3% in Arkansas^[23], and 38.00% in Ethiopia^[7]. Whereas 25.7% from Pakistan^[18], 25.63% from Kenya^[24], 10.3% in Kenya^[13], 5.8% in Trinidad^[8] reported low prevalence percentage of nematode as compare to the present findings, while 75.6% in Palestine^[25] and 56.00 % in Iran^[16] have been reported high prevalence percentage of nematode as compare to the present study. This result strongly suggested that *A. galli*. is most important and very common parasitic helminth infection of poultry. *Ascaridia* affects the growth rate and weight loss, which may be related to damage to the intestinal mucosa. *Ascaridia* significantly affects the health of chickens by sharing the feed consumed by the host, thus causing stunted growth and reduced egg and meat production^[19, 10].

Conclusion

The present study revealed that helminth infection is commonly found in desi poultry birds in Marathwada region. The most common cestode and nematode species in desi poultry birds are *Raillietina* spp. and *Ascaridia* spp. respectively. The prevalence of helminth infection in relation to season was found highest during summer than the rainy and lowest during winter season. Among the species *Ascaridia galli*. is most prevalent parasite affecting the health of desi poultry birds. This study indicated that helminth infection particularly cestode and nematode is highly prevalent in this region. Therefore improved poultry management practices for controlling the helminth infection and further studies on the appropriate control measures of helminth parasite in desi poultry birds need to be advised for improvement of poultry egg and meat production.

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