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Studies on the Seasonal Prevalence of Parasitic Helminths in Gavran (Desi) Chickens from Marathwada Region of Maharashtra.

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ABSTRACT

The present study deals with the seasonal prevalence of parasitic helminths in gavran (desi) chickens from Marathwada region. The survey was conducted during annual cycle June 2012 to May 2013 from different sampling station to estimate the seasonal prevalence of parasitic helminths. For this study 345 gavran chickens were randomly selected. A simple salt floatation method was employed for examination of parasitic helminths. The overall prevalence found 290 (84.05%) during the annual cycle. The seasonal prevalence percentage of parasitic helminths was highest during summer (93.09%), followed by rainy (85.27%) and lowest during winter (74.18%). There was considerable difference found in the seasonal prevalence. The present study is concentrated only on the prevalence of cestode (*Raillietina*) and nematode (*Ascaridia*). The average helminth parasite found in the chickens were cestode 90 (26.13%), nematode 138 (40.00%) while 62 (17.97%) mixed infestations. It was found that the percentage of seasonal prevalence of cestode (Summer: 29.31%, Rainy: 26.6%, Winter: 22.5%), nematode (Summer: 43.96%, Rainy: 41.28%, Winter: 35.00%) and mixed infection (Summer: 19.82%, Rainy: 17.43%, Winter: 16.66%). The major helminth parasites was found in the chickens include *Raillietina* spp. (23.71%) and *Ascaridia* spp. (36.24%). The results of the parasitic helminth are discussed in relation to seasonal variation and found highest during summer followed by rainy and lowest during winter season.

Keywords: Gavran (Desi) chickens, parasitic helminths, Marathwada, Seasonal prevalence.

1. 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, protozoans, viruses, and arthropods etc. Intestinal parasitic helminths have a serious impact on poultry health, productivity, quality and quantity of meat.

Helminth parasites of poultry birds are commonly divided into three main groups; cestodes, nematodes and trematodes. The cestodes of significant importance are of the two genera *Raillietina* and *Hymenolepis*. Nematodes 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 parasitic helminths 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 parasitic helminths in gavran (desi) chickens 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 parasitic helminths a systematic work has been undertaken to determine the overall and seasonal prevalence of the parasitic helminths and identify the common helminth parasites in gavran chickens from Marathwada region of Maharashtra.

2. Materials and Methods

The data for seasonal prevalence of the parasitic helminths is collected from gavran (desi) chickens procured from different parts of Marathwada region of Maharashtra. The survey was conducted during the annual cycle June 2012 to May 2013 from different sampling station. These samples were collected during each season of the annual cycle to determine the seasonal prevalence of parasitic helminths. From different part of Marathwada region the samples were obtained from various household small poultry farms and market of poultry. 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 gavran (desi) chickens in all season with more or less periodicity, under household management systems. The intestines of the chickens were brought to the laboratory for examination. The intestine was cut opened and simple salt flotation method was used and observes carefully for parasitic helminths. 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 is tabulated and analysed to show the seasonal prevalence of parasitic helminths 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 seasonal prevalence

of parasitic helminths in gavran (desi) chickens. The following formula is used to analyse the overall and seasonal prevalence of parasitic helminths.

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

3. Results and Discussion

The overall and seasonal percentage of prevalence of parasitic helminths in gavran chickens from Marathwada region during the annual cycle June 2012 to May 2013 is shown in Table 1. During the study period total 345 gavran chickens were randomly selected in all season more or less periodicity procured from different part of Marathwada region of Maharashtra. These chickens procured from household poultry farms and market of poultry, autopsied them and the intestine were brought to the laboratory and examined, out of 345 chickens, 290 (84.05%) were positive for parasitic helminths, showing the presence of helminth parasites in their intestine. Considering only the helminth infected chickens 290, a considerable difference was found in the prevalence of parasitic helminths among different season, with the highest value found in summer season 93.09% followed by rainy season 85.27% and lowest during winter season 74.18%. The gavran chickens were found to have 90 (26.13%) with cestode infection whereas 138 (40.00%) with nematode infection and 62 (17.97%) with mixed infection. There is no intestinal trematodes 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 seasonal prevalence of cestode (summer: 29.31%, Rainy: 26.6% and winter: 22.5%), nematode (summer: 43.96%, Rainy: 41.28% and winter: 35.00%) and mixed infection (summer: 19.82%, Rainy: 17.43% and winter: 16.66%) (Table 1). The major helminth parasites were observed in the chickens includes *Raillietina* spp. 23.17% and *Ascaridia* spp. 36.24%. The overall and seasonal prevalence percentage of parasitic helminth was highest during summer followed by rainy and lowest during the winter season.

Table 1: Overall and seasonal prevalence number and percentage of parasitic helminths in gavran (desi) chickens from Marathwada region during the annual cycle 2012-2013.

Season.	Months.	No. of chickens examined.	No. and % of parasitic helminth infected chickens.	Seasonal % of parasitic helminth.	No. and % of chickens infected with cestode.	Seasonal % of cestode infection.	No. and % of chickens infected with Nematode	Seasonal % of nematode infection.	No. and % of chickens with Mixed infection.	Seasonal % of mixed infection.
Rainy	June	27	22 (81.48)	85.27	8 (29.62)	26.6	10 (37.03)	41.28	4 (14.81)	17.43
	July	28	24 (85.71)		7 (25.00)		12 (42.85)		5 (17.85)	
	August	28	25 (89.28)		8 (28.57)		12 (42.85)		5 (17.85)	
	September	26	22 (84.61)		6 (23.07)		11 (42.30)		5 (19.23)	
Winter	October	31	23 (74.19)	74.18	7 (22.58)	22.5	11 (35.48)	35.00	5 (16.12)	16.66
	November	30	24 (80.00)		7 (23.33)		12 (40.00)		5 (16.22)	
	December	30	20 (66.66)		6 (20.00)		10 (33.33)		4 (13.22)	
	January	29	22 (75.86)		7 (24.13)		9 (31.03)		6 (20.68)	
Summer	February	29	27 (93.10)	93.09	9 (31.03)	29.31	12 (41.37)	43.96	6 (20.68)	19.82
	March	28	26 (92.85)		8 (28.57)		13 (46.42)		5 (17.85)	
	April	29	27 (93.10)		8 (27.58)		14 (48.27)		5 (17.24)	
	May	30	28 (93.33)		9 (30.00)		12 (40.00)		7 (23.33)	
Total		345	290 (84.05)	84.05	90 (26.13)	26.13	138 (40.00)	40.00	62 (17.97)	17.97

In the present study the prevalence percentage of parasitic helminth are found in gavran chickens but their findings are correlated with different types of poultry birds. The present study revealed an overall prevalence of parasitic helminths 84.05% in gavran

chickens in Marathwada region. These findings are more or less similar to the report of the other workers who reported the prevalence range in between 80.00% to 90.00% such as Nigeria, 87.7%^[5], Ethiopia, 89.5%^[6], Morocco, 89.9%^[7], and found higher

than the report of 10.5% in Trinidad^[8], 41.4% in Ethiopia^[9] and 53.00% in Nigeria^[1], whereas the present findings are lower than the report of 90.9% in India^[10], and reports from other countries such as Ethiopia 91%^[11], Kenya 90.78 %^[12] and 93.3%^[13], Iran 96%^[14], Jordan 91.6%^[15]. The intensity of prevalence of parasitic helminth by the parasites varied from different region and countries. The probable reason for such type of difference found in the prevalence of parasitic helminth might be due to the management and the 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 gavan chickens, overall infection with cestode was found in 90 (26.13%), whereas, nematode infection was in 138 (40.00%), with 62 (17.97%) chickens 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^[16], and in Jordan^[15] 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 shows that the prevalence of nematode is higher than cestode as found in the present study, whereas 4.1% and 5.5%, cestode and nematode respectively reported in different part of Trinidad^[8] while 1.56% and 19.1%, cestode and nematode respectively in south eastern Ethiopia^[9]. 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 report of the present study is correlated with the prevalence of cestodes 86.32%, and nematode 75.79% in central Ethiopia^[17], whereas the prevalence of cestode 83.00% and nematode 58.00% in Ethiopia^[6], which is higher than the result of the present study, this difference may be due to the effect of climatic condition in the study area and management as well as less number of intermediate hosts availability around the farms. No trematode infection was found in this study which is similar to the report in Jordan^[15]. 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 parasitic helminths 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 AM *et.al.*^[18] who reported the highest incidence of cestodes during summer, autumn and lowest in winter and spring season. The probable reason of the changes occurred during the season is; 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^[19, 20].

The prevalence of cestode (*Raillietina* spp) recorded during the study was 23.71 % these findings are more or less similar to the workers in Ethiopia^[9, 11], 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^[21], 63.7% in Ethiopia^[6], 58.00% in Iran^[14], 47.53 in Kenya^[12], also Trinidad^[8] who reported very low prevalence of 2.3% as compare to the present study.

The prevalence of nematode (*Ascaridia* spp) recorded during the study was 36.24%, which is more or less similar to the report of 37.3% in Arkansas^[21], 38.00% in Ethiopia^[9], 35.58% and 32.3% in Ethiopia^[11, 6] respectively, while some of the workers they are found low prevalence percentage of nematode as compare to the present study such as 25.7% from Pakistan^[16], 25.63% and 10.3% from Kenya^[22, 12] respectively and very lower report of 5.8% in Trinidad^[8], whereas 56.00 % in Iran^[14] and 75.6% in Palestine^[23] found high value of 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^[17, 11].

4. Conclusion

The present study revealed that parasitic helminth is commonly found in gavan chickens in Marathwada region. The most common cestode and nematode species in the chickens are *Raillietina* spp. and *Ascaridia* spp. The prevalence of parasitic helminths in relation to season was found highest during summer followed by rainy and lowest during winter season. Among these, *Ascaridia galli* is most prevalent parasite affecting the health of the chickens. This study indicated that parasitic helminths particularly cestode and nematode are highly prevalent in this region. Therefore sustainable ways for controlling the parasitic helminth and further studies on helminth parasite in chickens need to design for improvement of poultry egg and meat production.

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