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Studies on the prevalence of helminthic infection in desi poultry birds from Darbhanga region of North Bihar, India

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Abstract

The present communication deals with the study of prevalence of intestinal helminthic infection in desi poultry birds. The study was conducted during February 2014 to January 2015 from different farms in and around Darbhanga town. In all 315 birds were examined and average over all prevalence was found as 206 (65.39%) and with cestodes (20.22%), nematodes (30.16%) and mixed (13.01%), thus in an order of nematodes> cestodes> mixed ones. Among the cestodes *Raillietina* and *Davainea* infection and among nematodes *Ascaridia* and *Heterakis* were found common with prevalence as 24.13%, 4.44%, 28.89% and 7.93% respectively. Further, seasonal prevalence showed higher during summer (81.65%) followed by rainy (68.26%) and lowest during winter (45.09%). Thus the study indicated higher prevalence of helminthic infection particularly *Raillietina* (Cestode) and *Ascaridia* (Nematode) in desi poultry birds of the study area. Such information may be useful in designing improved poultry management in the area.

Keywords: Seasonal prevalence, helminthic infection, desi poultry birds, Darbhanga

1. Introduction

Intensive rising of poultry in commercial farms inevitably exposes flock to the various diseases which cause mortality of the birds and loss to the farmers. Diseased birds can also be hazardous to the human health on being taken in food. In India, huge loss of birds due to diseases is being felt by poultry farmers due to management related problems. Poultry carry heavy infection of varied types of parasites, i.e. helminth, protozoans, virus and arthropods etc. Intestinal parasitic helminthes 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; cestode, nematode and trematode. The cestodes of significant importance belong to two genera *Raillietina* and *Davainea*, whereas nematodes include *Ascaridia* and *Heterakis* constituting the most important group of helminth parasites in poultry ^[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 helminths infection ^[2]. Many insects that may act as vectors for helminths are also favored by high temperature 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 summer season ^[3]. Hence considering the economic importance of the diseases caused by parasitic helminths in desi chickens, which in turn affect on total production causing heavy economic loss to the farmer and also keeping in view the severity of the parasitic helminths a systematic work has been undertaken to identify the common helminth parasites and to determine the overall and seasonal prevalence of the helminth infection in Desi poultry birds of this study area. No such report on the seasonal dynamics of desi poultry birds has been made so far from this region, hence the present communication forms the first report from Darbhanga region of North Bihar.

2. Material and Methods

For obtaining the data on the prevalence of the intestinal helminth infection in desi poultry birds (chickens) of Darbhanga region (North Bihar), the present study was conducted from February 2014 to January 2015 and a total of 315 desi chickens were randomly selected from Household poultry farms and market of poultry in and around Darbhanga town. The intestines

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of the chickens were brought to the laboratory, cut opened and simple salt flotation method was used to observe carefully for helminthic infection. The helminth parasites were collected, fixed in fixatives and further processed for taxonomic study and their identification was carried out with the help of *helminthological* key [4]. The data obtained during the survey period is tabulated and analyzed to show the prevalence of helminth infection in different months and season from different parts of study area. The detailed studies were undertaken with a view to finding out the data of prevalence of parasitic helminths in desi poultry birds using the formula: Prevalence = (No. of birds infected/No. of birds examined x 100)

3. Results and Discussion

From the data in the Table 1 a considerable difference was found in the prevalence of helminthic infection among different seasons with the highest value in summer (81.65%), followed by rainy (68.26%) and lowest during winter season (45.09%). Out of 315 desi birds examined only 206 were found infected and out of them 70 (22.22%) with cestode, 95 (30.16%) with nematode and 41(13.01%) with mixed infection and remarkably no intestinal trematode was detected in the present study. Hence in the present study the survey conducted only on the prevalence of cestode and nematode parasites. The major helminth parasites observed in the desi poultry birds include *Railletina* sp. (24.13%), *Davainea* sp. (4.44%), *Ascaridia* (28.89%) and *Heterakis* (7.93%) It was found that the percentage of prevalence of cestode (summer = 27.05%, rainy = 22.22%, and winter 18.45), nematode (summer = 40.02%, rainy = 30.75% and winter = 19.51% and mixed infection (summer = 15.59%, rainy = 15.38% and winter 7.84%). The overall and seasonal prevalence percentage of helminth infection was found highest during summer followed by rainy and lowest during the winter season. The present study revealed an overall prevalence of helminth infection as 65.39% in desi poultry birds in the study area which is more or less similar to the report of 75.8% in Quetta, Pakistan [5], 63.00% in Parbhania [6]. However, there are reports of higher prevalence from other countries such as Ethiopia 91% [7], 89.5%. Morocco [8], 89.9% [9], Kenya

90.78% [10], 93.3% [11], Nigeria 87.7% [12], Iran 96% [13] and Jordan 91.6% [14]. Thus it may be said that the prevalence of helminth infection varied in different region and countries. The probable reason for such types of difference found in the prevalence of helminth infection might be due to the management and environmental related factors. Also this might be due to difference in the season of conducting 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 70 (22.22%), whereas nematode infection 95 (30.16%), with 41(13.01%) birds showing mixed infection, i.e. both cestode and nematode in their intestines. That is, the prevalence of nematode infection was found higher than cestode and mixed infection, and also the higher prevalence of nematode as compared to cestode might be due to the possibility of exposure to suitable less number of intermediate hosts availability around the farms and difference in the intensity of care between the farms in the area. Remarkably no trematode infection was found in the present study which might be due to the absence of necessary intermediate (molluscan) host around the farms. The prevalence of helminth infection was found highest during summer, followed by rainy and lowest in winter season and these findings are more or less similar to that of [15]. Such seasonal difference, statistically significant ($F_{2,4}(\text{Season}) = 11.28$ at $p > 0.05$; $LSD = 12.43$) may be due to different geographical area, study period and seasonal changes due to temperature and humidity also. Many insects that may act as vectors for helminth infection are also favored 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. This result strongly suggested that *A. galli* is the 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.

Table 1: Overall prevalence of helminthic infection in desi poultry birds from Darbhanga region during annual cycle 2014-2015.

Season	Months	No. of examined birds.	No of infected birds (prevalence)	Seasonal Prevalence	Number and prevalence of helminthic infection					
					Cestode		Nematode		Mixed	
Summer	Feb	22	19(86.36)	81.65	7(31.82)	27.05	10(45.45)	40.02	3(13.64)	15.59
	Mar	32	25(78.12)		8(25.00)		12(37.5)		5(15.62)	
	Apr	28	20(71.43)		4(14.28)		11(39.28)		5(17.85)	
	May	27	25(92.59)		10(37.03)		10(40.00)		4(14.81)	
Rainy	June	21	18(85.71)	68.26	6(28.57)	22.22	8(38.09)	30.75	4(19.05)	15.38
	July	25	17(68.00)		5(20.00)		8(32.00)		4(16.00)	
	Aug	31	15(48.38)		4(12.90)		7(22.58)		5(16.12)	
	Sep	27	21(77.77)		8(29.63)		9(33.33)		3(14.28)	
Winter	Oct	28	12(42.85)	45.09	5(17.86)	18.45	5(17.85)	19.51	3(10.71)	7.84
	Nov	23	15(65.21)		8(34.78)		7(30.43)		2(8.69)	
	Dec	19	09(47.37)		2(10.53)		4(21.05)		1(5.26)	
	Jan	32	10(31.25)		3(9.37)		4(12.50)		2(6.25)	
Total		315	206(65.39)		70(22.22)		95(30.16)		41(13.01)	
Mean				66.33		22.57		30.09		12.93
±SD				±20.34		±4.31		±10.27		±4.41

Figure of Prevalence in %

$F_{2,4}(\text{Season}) = 11.288$ ($p > 0.05$)

$F_{2,4}(\text{months}) = 27.85$ ($p > 0.01$)

$LSD = 12.43$

Table 2: Species wise prevalence of helminth parasites.

Season	No. of birds examined	Number & prevalence (%) of birds infected with Helminth Species			
		<i>Raillietina</i>	<i>Davainea</i>	<i>Ascaridia</i>	<i>Heterakis</i>
Summer	109	31(28.44)	6(5.50)	39(35.77)	13(11.92)
Rainy	104	27(25.96)	4(3.84)	32(30.76)	8(7.69)
Winter	102	18(17.64)	4(3.92)	20(19.60)	4(3.92)
Mean % of infected birds	315	76(24.13)	14(4.46)	91(28.89)	25(7.93)

F Df 2,2 (Season) = 2.11 (p>0.05) F (helminth species) = 8.33 (NS) LSD = 7.78

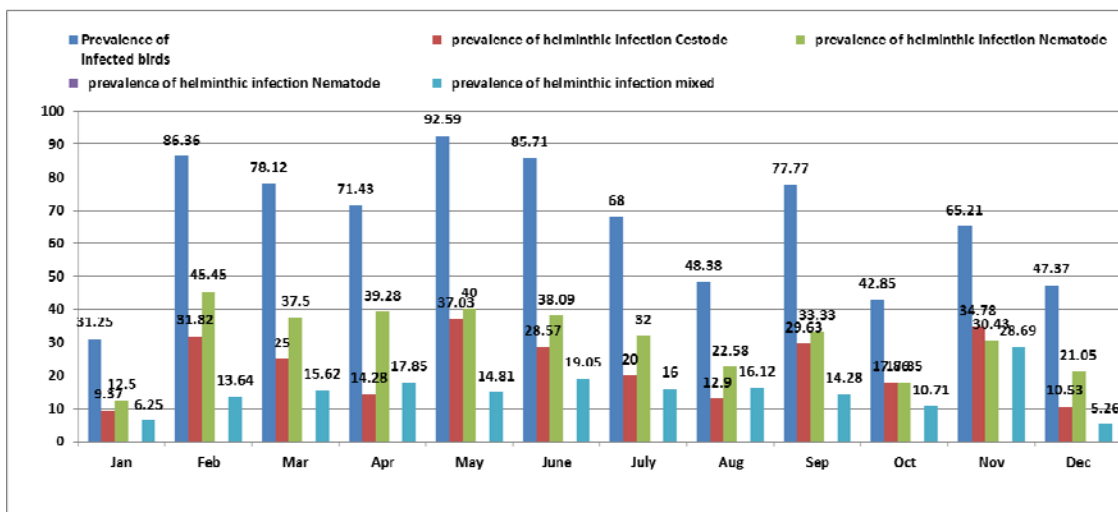


Fig 1: Monthly variation of Helminthic Infection in Desi Poultry Birds

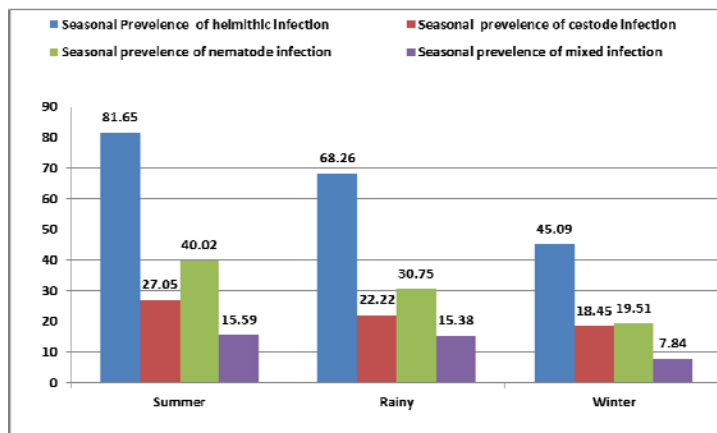


Fig 2: Seasonal variation of Helminthic Infection in Desi Poultry Birds

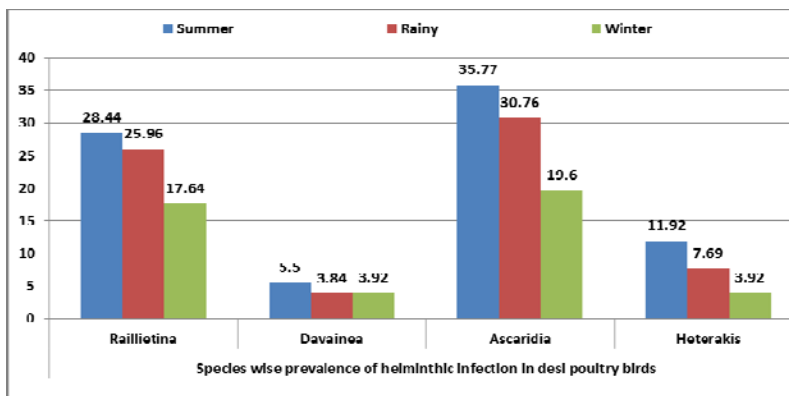


Fig 3: Species wise prevalence of helminthic infection in desi poultry birds

4. Conclusion

The present study revealed that helminth infection is commonly found in desi poultry bird in Darbhanga 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 regardless of the helminth species. Among the species *Ascaridia galli* is the most prevalent parasite affecting the health of desi poultry birds. The study indicated the 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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