

Research Article



Prevalence of Gastrointestinal Parasites in Sonali Chicken at Sadar Upazila of Dinajpur

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Abstract | The present study was conducted to determine the prevalence of gastrointestinal parasites in Sonali chicken in Dinajpur during January to June 2024. For this purpose, a total of 200 faecal samples were collected from various commercial Sonali farms and examined by direct smear method and floatation technique. Among the examined birds, 56 Sonali chickens (28.00%) were infected with gastrointestinal parasites including *Ascaridia* sp., *Raillietina* sp. and *Eimeria* sp. Among these parasites, *Eimeria* sp. (15.5%) was the most prevalent ($P < 0.001$) parasite, followed by *Ascaridia* sp. (11.5%) and *Raillietina* sp. (1.00%), respectively. A significantly ($P < 0.01$) higher prevalence of gastrointestinal parasites was recorded among Sonali chicken of 5-9 weeks of age (37.39%) than 1-4 weeks (15.29%). *Eimeria* sp. was significantly higher in 5-9 weeks aged Sonali chicken but *Ascaridia* sp. and *Raillietina* sp. were non-significantly ($P > 0.05$) higher in 5-9 weeks old birds. It was also observed that gastrointestinal parasites were more ($P > 0.05$) in female (29.17%) than male (26.25%) birds. Higher ($P > 0.05$) prevalence of *Eimeria* sp. and *Raillietina* sp. was found in female, but *Ascaridia* sp. was found higher ($P > 0.05$) in male Sonali chicken. The present study revealed that gastrointestinal parasites are prevalent and heavy infection may decrease the production performance, increase mortality of birds as well as cause significant economic loss in Sonali poultry farming at the study area. Taken together, regular examination for parasites and deworming approaches are suggested for profitable Sonali poultry farming.

Keywords | Sonali chicken, Gastrointestinal, Parasites, Prevalence, Faeces, Deworming

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INTRODUCTION

Bangladesh is considered as the most densely populated country in the world. The demand of fast-growing population for food, particularly animal source, is increasing rapidly. Poultry industry plays significant role to meet up the animal protein demand of human in Bangladesh (Talukdar et al., 2017). The livestock population of Bangladesh is also high, similar to high population density and nearly 80% of population is involved in agriculture and

livestock farming (BBS, 2008). Therefore, the total livestock population is about 442.85 million including 385.70 million poultry in Bangladesh (Livestock Economy, 2022-23). The livestock contributes about 1.85% in Gross Domestic Product (GDP) and share 16.52 % GDP to agricultural sector in Bangladesh (Livestock Economy, 2022-23).

Poultry industry plays a vital role in rural socio-economic system as most of the households directly involved in livestock in Bangladesh. It contributes significantly on

national economic growth and generates numerous job opportunities (Islam et al., 2020) and the production of cheaper animal proteins (Rahman et al., 2017). In Bangladesh, poultry meat contributes about 37% of the total meat production (Begum et al., 2011).

Sonali chicken among the poultry species has become an important part of poultry production in Bangladesh and gains its more popularity as well as acceptance than broiler due to its more or less similar phenotypic appearance with the indigenous chicken. However, the productivity of sonali is interfered not only by improper management practices but also by various poultry diseases especially parasitic diseases. Parasitic diseases are one of the most serious problems of sonali chickens especially in the developing country and causes significant economic losses and discourage the rearing of the poultry (Islam et al., 2020). Nematodes, cestodes and coccidia are the common gastrointestinal parasites that cause infection in poultry include (Islam et al., 2020). The gastrointestinal parasites cause considerable damage and great economic loss to the poultry industry due to malnutrition, decreased feed conversion ratio, decreased production, increased mortality especially young birds and high treatment or prevention cost (Puttalakshamma et al., 2008). Therefore, this study was conducted to investigate the prevalence of gastrointestinal parasites in commercial Sonali poultry farms to guide the future parasitism and deworming approaches.

MATERIALS AND METHODS

STUDY AREA, PERIOD AND BIRDS

The present study was conducted in various commercial Sonali farm of Dinajpur sadar upazila (Figure 1) and faecal examination was performed at the Department of Pathology and Parasitology of Hajee Mohammad Danesh Science and Technology University (HSTU), Dinajpur during January to June, 2024. Fecal samples of 200 Sonali chicken were examined. The age and sex of Sonali chicken was recorded by interviewing with farm owners. The Sonali chickens were grouped into 1-4 weeks (85) and 5-9 weeks (115) age on the basis of age and also grouped into male (80) and female (120) according to sex.

COLLECTION AND EXAMINATION OF FAECES

Faecal samples were collected either from the upper surface of litter immediately after dropping of faeces by selected Sonali chicken or intestinal content during the post-mortem examination of the Sonali chicken or directly from cloaca by abdominal messaging with necessary data. Each sample was placed in a separate, properly labeled glass vial containing 10% formalin for preservation and transportation to the laboratory. Faecal sample was examined by Direct Smear method and Floatation technique using sat-

urated salt (Sodium chloride) solution with standard protocol.

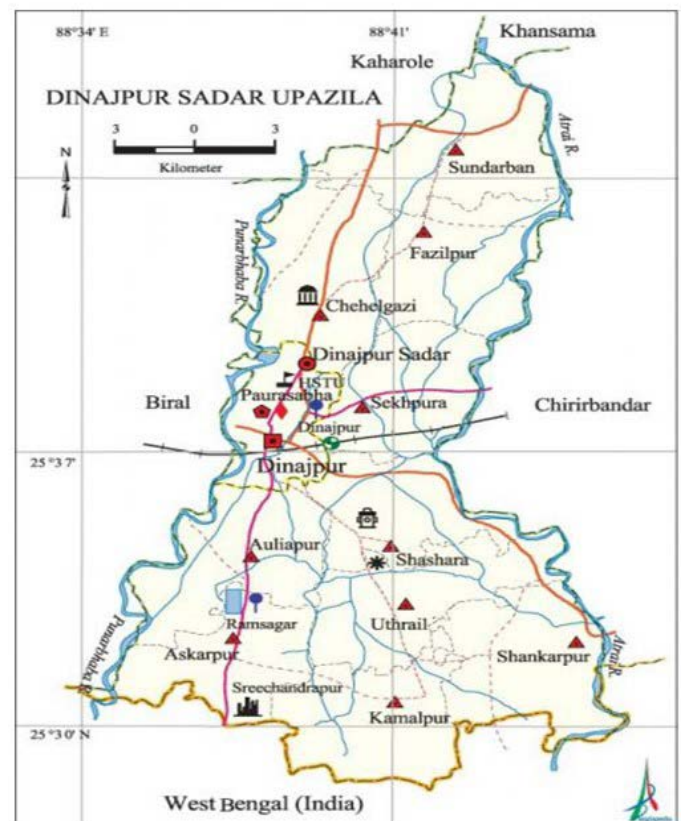


Figure 1: Map of Study Area (Dinajpur sadar upazila)

STATISTICAL ANALYSIS

Statistical analysis of collected data was done by Chi-Square Test using statistical software 'SPSS' (version 22). The results was expressed in percentage with P-value and level of significance was determined when $P < 0.05$.

RESULTS

PREVALENCE OF GASTROINTESTINAL PARASITES IN SONALI CHICKEN

Faecal samples of 200 sonali chickens were examined. Of which 56 sonali chickens were infected with gastrointestinal parasites (Figure 3). Therefore, the overall prevalence of gastrointestinal parasites in sonali chicken was 28.00%. *Ascaridia* sp., *Raillietina* sp. and *Eimeria* sp. were identified in this study. Among these parasites, *Eimeria* sp. (15.5%) was significantly ($P < 0.001$) highest, followed by *Ascaridia* sp. (11.5%) and *Raillietina* sp. (1.00%), respectively (Figure 2).

PREVALENCE OF GASTROINTESTINAL PARASITES BASED ON AGE OF SONALI CHICKEN

The present study indicated that prevalence of gastrointestinal parasites was significantly ($P < 0.01$) higher in sonali chicken aged between 5-9 weeks (37.39%) than 1-4 weeks (15.29%). *Ascaridia* sp. and *Raillietina* sp. were higher in

Table 1: Prevalence of gastrointestinal parasites according to age of sonali chicken

Name of parasite	Age				P-value
	1-4 weeks (85)		5-9 weeks (115)		
	Positive no.	Prevalence (%)	Positive no.	Prevalence (%)	
<i>Ascaridia</i> sp.	6	7.06	17	14.78	0.091 (NS)
<i>Raillietina</i> sp.	0	0.00	2	1.74	0.304 (NS)
<i>Eimeria</i> sp.	7	8.24	24	20.87	0.015*
Overall	13	15.29	43	37.39	0.001*

Table 2: Prevalence of gastrointestinal parasites based on sex of sonali chick

Name of parasite	Age				P-value
	Male (80)		Female(120)		
	Positive no.	Prevalence (%)	Positive no.	Prevalence (%)	
<i>Ascaridia</i> sp.	10	12.5	13	10.83	0.717 (NS)
<i>Raillietina</i> sp.	0	0.00	2	1.67	0.518 (NS)
<i>Eimeria</i> sp.	11	13.75	20	16.67	0.577 (NS)
Overall	21	26.25	35	29.17	0.653 (NS)

5-9 weeks aged sonali chicken than 1-4 weeks of age but no significant ($P>0.05$) variation was found. No *Raillietina* sp. was recorded in sonali chicken of 1-4 weeks age. Sonali chicken aged between 5-9 weeks (20.87%) had significantly ($P<0.05$) higher *Eimeria* sp. than 1-4 weeks of age (8.24%) (Table 1).

PREVALENCE OF GASTROINTESTINAL PARASITES BASED ON SEX OF SONALI CHICKEN

Sex-wise prevalence of gastrointestinal parasites in sonali chicken was recorded (Table 2). It was observed that female sonali chickens (29.17%) carried higher ($P>0.05$) infection with gastrointestinal parasites than male (26.25%). Female birds were more prone to *Raillietina* sp. and *Eimeria* sp. than male but the prevalence of *Ascaridia* sp. was higher ($P>0.05$) in male sonali chicken.

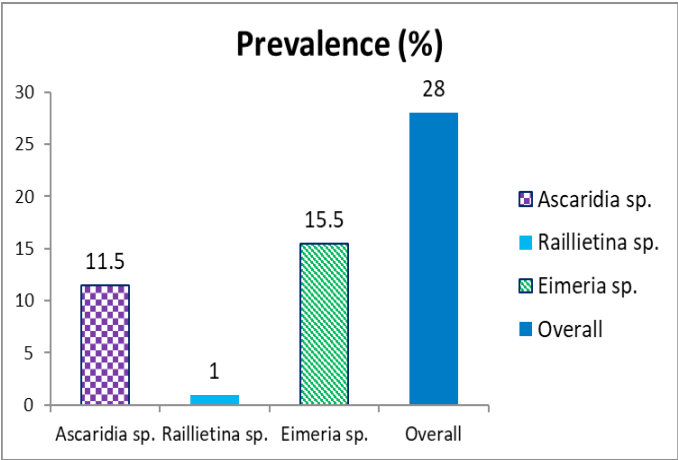


Figure 2: Prevalence of gastrointestinal parasites in Sonali chicken



Figure 3: Intestine of sonali chicken with parasites

DISCUSSION

Parasitic infection is one of the vital problems in sonali production which reduce production performance, utilization of host nutrients and behavioral alterations (Islam et al., 2020) of birds as well as responsible for high morbidity and mortality (Das et al., 2022).

The overall prevalence of gastrointestinal parasites in sonali chicken observed in this study was 28.00% which is slightly higher than Islam et al. (2020) who recorded 22.4% prevalence of intestinal parasites in sonali chickens. Das et al. (2022) observed slightly prevalence (37.20%) of gastrointestinal parasites parasitic infections in backyard chicken. Salawu and Emmanuel (2023) and Afia et al. (2019) found higher prevalence (83.3% and 100% respectively) of gastrointestinal helminthes in local chickens in Nigeria. 90.97%, 86.6% and 54.2% infections were observed

by Berhe et al. (2019), Wamboi et al. (2020) and Nguyen et al. (2020) in Ethiopia, Kenya and Vietnam respectively. Lower prevalence of gastrointestinal parasites in sonali chicken in this study may be due to birds having minimum chance of getting parasitic infection, rearing system and use of anthelmintic. This variation may be due to variation in the collection of sample, geographical location, climatic conditions, study methods, rearing system, management practices and use of anthelmintic.

In this study, *Ascaridia* sp., *Raillietina* sp. and *Eimeria* sp. were recorded. In previous studies, most of the authors found more or less similar parasites such as *Ascaridia* sp., *Raillietina* sp., *Capillaria* sp. and *Eimeria* sp. in Bangladesh, Nigeria and Nepal (Islam et al., 2020, Salawu and Emmanuel, 2023, Das et al., 2022, Wuthijaree et al., 2018, Subed et al., 2018).

It was also observed that prevalence of gastrointestinal parasites in sonali chicken was significantly increased with increased of age. Similar results are recorded by Islam et al. (2020), Ola-Fadunsin et al. (2019) where they observed higher prevalence in advance of age. The finding of this study is not in the line with the findings of Salawu and Emmanuel (2023) and Das et al. (2022) who observed lower prevalence in adult chicken. Afia et al. (2019) recorded higher prevalence of helminth parasites in grower, followed by adult and chicks respectively. No *Raillietina* sp. was found in 1-4 weeks aged sonali chicken which is supported by Islam et al. (2020). Belal (2017) observed that coccidiosis was higher in 5-16 weeks of chicken. High rate of infection in adult sonali chicken may be due to continuous exposure to infections from the contaminated litter as well as frequent contact with the intermediate host and external environment.

The results of this study indicated that prevalence of gastrointestinal parasites was higher in female than male. The present study supports the findings of Islam et al. (2020) and Hafiz et al. (2015) where they reported higher prevalence in female chickens. But Afia et al. (2019) and Salawu and Emmanuel (2023) found higher prevalence in male birds. This variation may be due to variation in the collection of sample, climatic conditions, study methods, study area and management practices. This high rate in female birds might be due to malnutrition resulting from competitive feed intake with male birds. However, prevalence rate of gastrointestinal parasites is not statistically different between male and female birds indicating both sexes have equal chances of becoming infected with gastrointestinal parasites. The limitations of the current study were sample size and study area.

CONCLUSION

Gastrointestinal parasites are one of the major problems of poultry production that affect productivity and health status of poultry. A total of 28% of sonali chickens were infected with three gastrointestinal parasites such as *Ascaridia* sp., *Raillietina* sp. and *Eimeria* sp. and *Eimeria* sp. was the highest prevalent parasite. Gastrointestinal parasites were found in high proportion in female and 5-9 weeks old sonali chicken. Gastrointestinal parasites remained as major constraints for profitable sonali farming in poultry hub areas of Bangladesh. Therefore, effective preventive and controlling measures including regular deworming and improved hygienic managements should be followed strictly by poultry farmers.

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CONFLICT OF INTEREST

There is no conflict of interest.

NOVELTY STATEMENT

This research has highlighted the prevalence of most common gastrointestinal parasites in sonali chicken at the study area.

AUTHORS CONTRIBUTION

Rahman MG: collected data and sample, microscopic examination of sample, prepared and corrected the manuscript. Harun-Ur-Rashid SM: helped in preparation and correction of manuscript, Azam MG: Assisted in identification of parasites, Habib MA: assisted in data analysis, Devsharma GR: helped in collection and examination of sample.

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