



The Gastrointestinal Helminth Infection among Backyard Fowl Population of Selected areas of North 24 Parganas, West Bengal

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ABSTRACT: Poultry is a promising sector in India which is increasing day by day. Poultry production is hindered by many problems among which various diseases namely parasitic infection are most important. The present study was conducted in North 24 Parganas district of West Bengal, India to determine the prevalence of gastrointestinal helminth in backyard fowl and to study the gross histopathological lesions produced by them.

Keywords: Helminth Infection, Backyard fowl, parasite, intestine,

INTRODUCTION

The poultry industry occupies an important position in the provision of animal protein (meat and egg) to man and also plays an important role in the national economy as a source of revenue. Local chicken production is good but constrained by many extrinsic factors like malnutrition, poor management and the absence of biological security which is very outstanding. The chickens are generally raised in a free range system scavenging around the compound of households, feeding on the locally available resources like earthworm, household refuse, insects, residue from harvest, animal and human faeces etc (Ajala *et al.*, 2007).

Helminthiasis was considered to be an important problem of local chicken and helminth parasites have been incriminated as a major cause of ill-health and loss of productivity in different parts of world. Poultry reared in rural scavenging system face various hindrances among which helminthiasis plays a vital role. The present study was conducted to observe the prevalence of helminthiasis in gastrointestinal tract along with histopathological study of intestine infected with parasite.

MATERIALS AND METHODS

A. Study Area

The study was conducted in areas of North 24 Parganas district of West Bengal, India where poultry reared in rural scavenging system for economic purpose.

B. Sample Collection

The intestines were dissected longitudinally and screened for the presence of helminthic parasites. The adult parasites recovered from the intestine were preserved in 10% formalin for identification. After collection, each of the gastrointestinal tracts was examined thoroughly from the outer surface, to detect the gross pathological changes, if any.

C. Study of Parasite

The gastrointestinal tract was subjected to routine examination to collect the gastrointestinal parasites, according to the procedure as described by Fowler (1990). Internal surface of the intestinal tracts was also investigated thoroughly to detect the gross pathological changes, if any. The gross pathological changes were recorded carefully. From the suspended viscera, mucosal scrapping was taken and examined under microscope at 10X and 40X magnifications by adding a drop of normal saline, mounting with a coverslip to detect tiny parasites which deeply burrow into the mucosa, if any. Parasites of the intestinal tract were separated from the intestinal content by repeated sedimentation and made clearly gentle washing with PBS. After washing nematodes were collected by the help of curved needle and kept in glycerine alcohol. Cestodes and trematodes were collected by the help of dropper and preserved in 10% formalin for identification. Through morphological study of nematodes were performed by the preparation of sub permanent slide by adding one drop of lactophenol.

The collected parasites were fixed in AFA (Alcohol Formal Acetic acid) for a few minutes. After fixation the parasites were preserved in 70% ethyl alcohol in vials for prolonged storage. The helminth parasites were kept in lactophenol for 5-7 days for visibility of the internal organs. The recovered nematode and smeared slide were stained with Borax Carmine for one and half to two hours and then after dehydrating in alcohol graded series of 50%, 70%, 90% and 100%. Then the parasites were cleaned with xylene and mounted in Canada balsam (Aloo *et al.*, 2004).

D. Histopathological Study

Tissues like intestine were isolated from backyard fowl. Physiological saline solution (0.58% NaCl) was used to rinse and clean the tissues. They were fixed in aqueous

Bouin's Solution for 48hrs processed through graded series of alcohol, cleared in xylene and embedded in paraffin wax. Sections were cut at 6µm thickness with the help of 820 Spencer rotary Microtome, stained with haematoxylin eosin and were mounted in Canada balsam for study.

RESULTS AND DISCUSSION

A. Parasitological analysis

In the present study 25 backyard fowl were screened for the presence of gastrointestinal parasites. The birds were collected from areas of North 24 Parganas, during November to March. Among 25 backyard fowl all are found positive of gastrointestinal parasites by gross infection of gastrointestinal tract (Table 1).

Table 1: Overall Prevalence and percentage of Helminthic infection in backyard fowl of selected areas of North 24 Parganas.

Time period	No. of birds examined	No. of Helminth infected bird	Seasonal % of Helminth infection	No. of bird infected with cestode	Seasonal % of cestode infection	No. of bird infected with nematode	Seasonal % of nematode infection	No. of bird with mixed infection	Seasonal % of mixed infection
November	5	5	100%	2	40%	5	100%	2	40%
December	5	5	100%	0	0	5	100%	0	0
January	5	5	100%	3	60%	5	100%	3	60%
February	5	5	100%	3	60%	5	100%	3	60%
March	5	5	100%	4	80%	5	100%	4	80%

Out of 25 positive backyard fowl 12 were found positive for cestode, 25 harbour nematode and 12 had mixed infection.

The prevalence of helminth parasite species during the study was *Polymorphus sp.* (Fig. 1C) and *Raillietina sp.* (Fig. 1A).

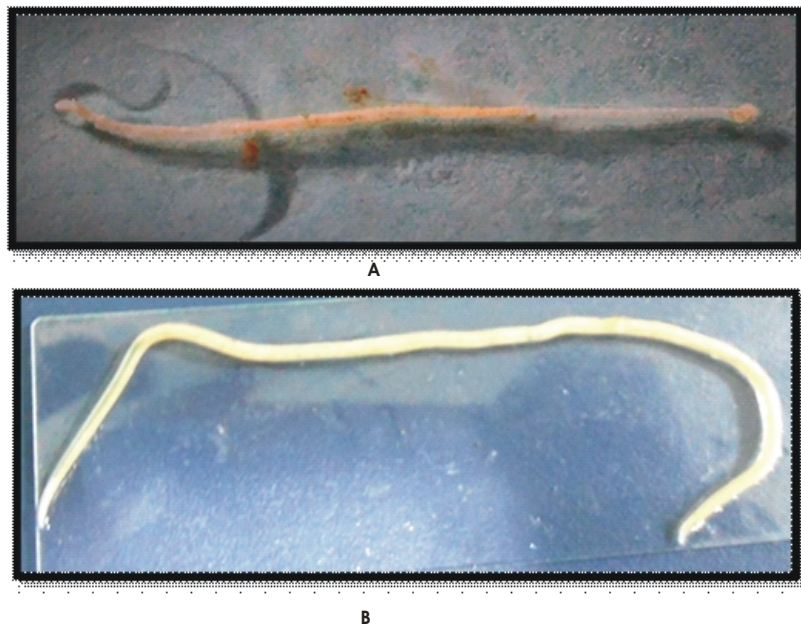


Fig. 1. Whole parasites collected from backyard fowl in slide. (A). *Raillietina sp.* (B). *Ascaridia sp.*



Fig. 1. Whole parasites collected from backyard fowl in slide. (C). *Polymorphus sp.*

Among 25 positive for nematodes had *Heterakis sp.* (Fig. 2), *Syngamus sp.* (Fig. 3), *Strongyloides sp.* (Fig. 4) and *Ascaridia sp.* (Fig. 1B). Backyard poultry are reared in semi-scavenging system, in which they collect maximum of their food from the nature.

Their food enterprise includes different types of seeds, kitchenwastes, insects, slugs, earthworms etc that act as intermediates or paratenic hosts of many bio parasites (Soulsby, 1982).

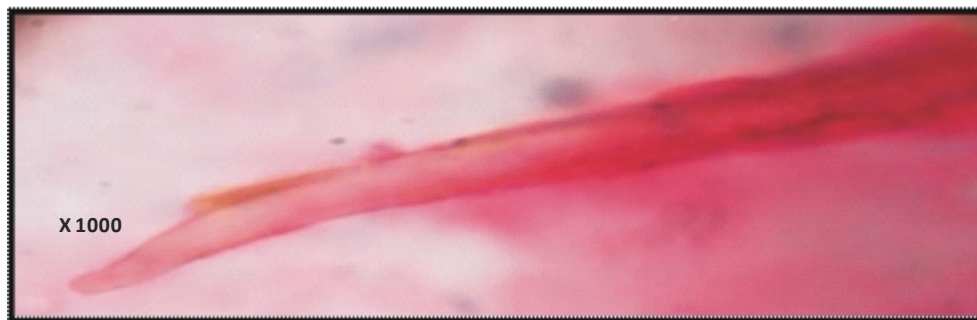


Fig. 2. Photomicrograph of nematode (*Heterakis sp.*) collected from intestine of backyard fowl.

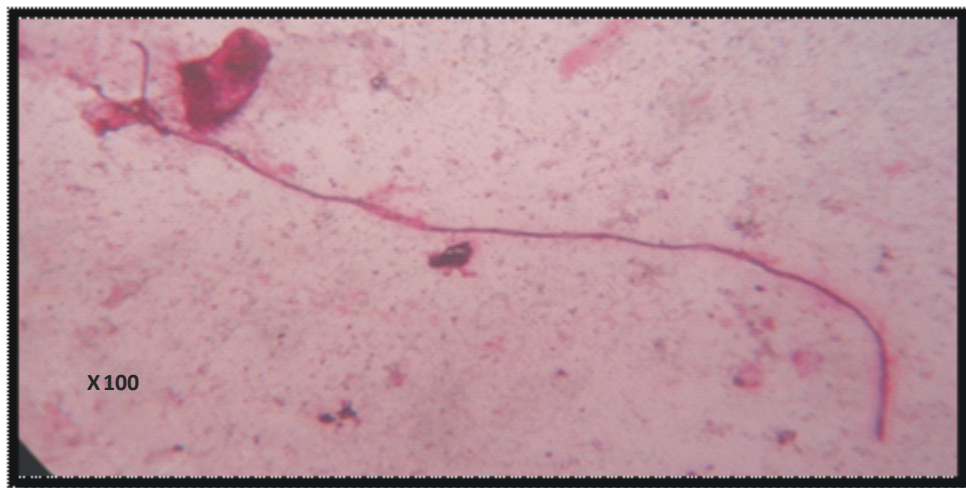


Fig. 3. *Syngamus sp.* recovered from intestine of backyard fowl.

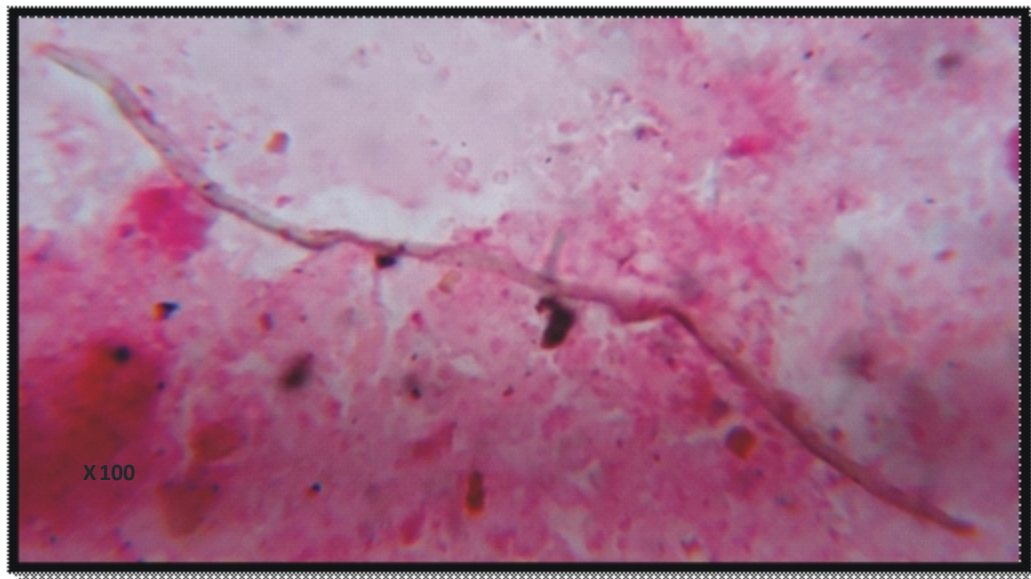


Fig. 4. Photomicrograph of nematode (*Strongyloides sp.*) collected from intestine of backyard fowl.

Pathological changes were produced by *Ascaridia sp.*, *Hymenolepis sp.* (Fig. 5, 6, 7 and 8). *Syngamus sp.* and *Strongyloides sp.* exhibit gross pathological changes

that include degeneration of intestinal epithelium (Fig. 7). Gross changes observed depended on the parasite load.

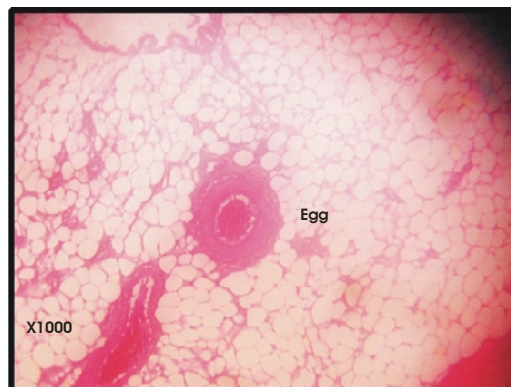


Fig. 5. Histopathological section of intestine of backyard fowl infected with egg of *Ascaridia sp.*

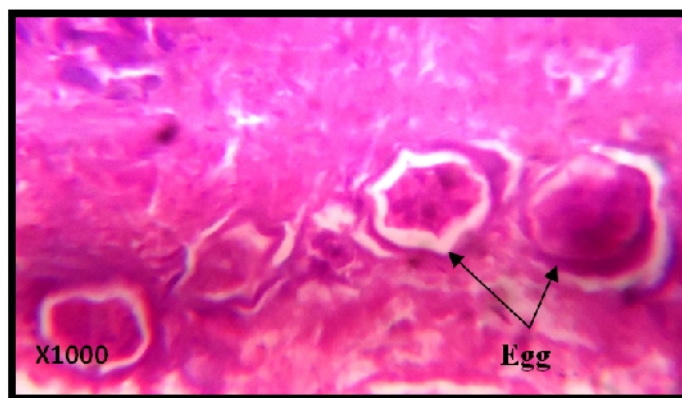


Fig. 6. Histopathological section of intestine of backyard fowl infected with egg of *Hymenolepis sp.*

Moderate infections were associated with mucous enteritis. The intestinal wall appeared to be thickened with mucosa giving a velvety appearance. Histopathological sections of the parasites were found in the lumen (Fig. 8). The histopathological epithelium lesions varied from degeneration of living epithelium to sloughing of mucosa. Mucosa degeneration with vacuolation of lining epithelial cells was a constant

feature (Fig. 8). The higher prevalence of helminths were observed and pathology directly reflects their economic importance and warrants conscious intervention for its control in backyard fowl. Alternation should be focused toward the improvement of the poultry management and more care should be given for rearing local breeds of chicken.

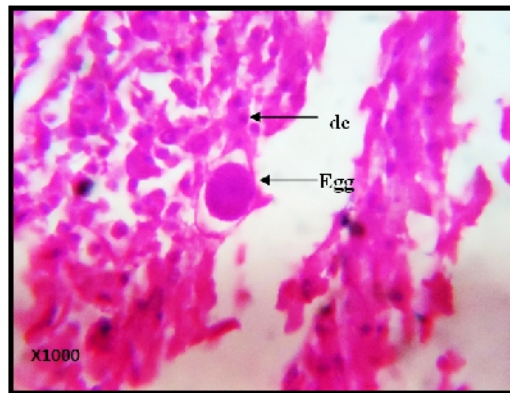


Fig. 7. Histopathological section of intestine of backyard fowl infected with egg of *Syngamus* sp. exhibiting disrupted intestinal epithelium (de).

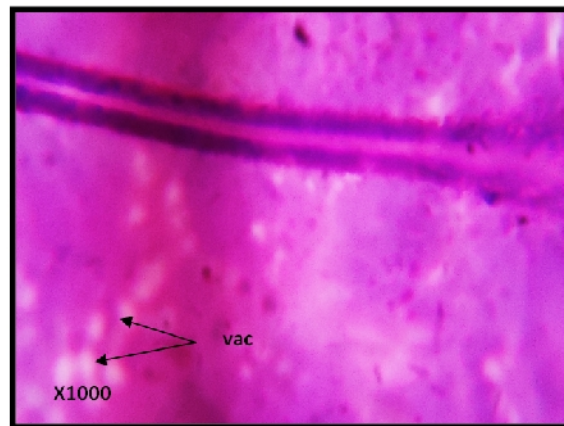


Fig. 8. Histopathological section of intestine of backyard fowl infected with *Strongyloides* sp. exhibiting vacuolation (vac).

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