COMPARATIVE INCIDENCE OF HELMINTH PARASITES IN DOMESTIC FOWL, WHITE LEG HORBNE, LAYER AND COCK

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Abstract: Investigation on gastrointestinal helminths was conducted on 20 domestic fowl, 20 white leghorn, 20 layer and 20 cock of Dhaka city. Six species of helminth belonging to trematode, cestode and nematode were found to infect the different parts of alimentary canal of domestic fowl. The prevalence of helminths in domestic fowl were as follows: Catatropis verrucosa (25%), Amoebotaenia sphenoides (10%), Hymenolepis cantaniana (35%), Rallietina echinobothrida (55%), Ascardia galli (70%) and Heterakis gallinarum (30%) whereas, in white leghorn the prevalence of Rallietina echinobothrida (20%) and Ascardia galli (35%) were recorded. In layer, higher prevalence of Rallietina echinobothrida (55%) and Ascardia galli (60%) were recorded; in cock the prevalence of specific helminthes were as follows: Hymenolepis cantaniana (10%), Rallietina echinobothrida (40%), Cotugnia digonopora (20%), Ascardia galli (60%) and Heterakis gallinarum (25%). Along with the prevalence and intensity of infestation of different species of parasites, intensity were also recorded. Highest number of parasites were collected from intestine.

Key words: Parasites, helminth, fowl, layer, cock

INTRODUCTION

Certain ecological traits of vertebrate host could facilitate parasite colonization or within host speciation, creating differences in parasite species richness among host taxa and obscuring the influence of co-speciation. These ecological parameters determine to some extent the likelihood that hosts encounter and are colonized by new parasite species as well as the diversity of riches available to parasites (Paulin 1995). The patterns above reflect the distribution of parasite diversity among host species with respect to host features, not necessarily the rates of parasites diversification within these intestinal parasites of vertebrates, genera represented by two or more species (Kennedy and Bush 1992). The diversity of species in a given habitat depends upon the probabilities of the properties of the habitat (Hassouni and Belghyti 2006, Molla et al. 2012). Pattern in the diversity of parasites may be associated with either host or parasites’ characteristics. This may determine the likelihood that hosts are colonized by parasite species over evolutionary time (Shinde et al. 2004, 2009).

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Parasitism results into morbidity and mortality in tropical countries, particularly in the socio-economically under developed societies in the world. These types of parasites affect not only human health but also livestock, poultry, fishes and crops etc. Parasitic infection of livestock, poultry, fishes; crops are major ailments impend the development of these industries in Bangladesh (Yadav and Tandon 1991). The most commonly kept poultry are chickens (Gallus sp.), ducks (Cairina sp.), geese (Anser sp.) and turkeys (Meleagris sp.). Among these, domestic chickens (Gallus domesticus) are the most (FAO 2007, Mekibib et al. 2014). Compared to a number of other livestock species, fewer social and religious taboos are related to the production, marketing and consumption of poultry products. For these reasons poultry products have become one of the most important protein sources for man throughout the world (Abdul-Hamed 1984, Bhure et al. 2013). Commercial hybrids are used by the commercial system, while the village system makes use of indigenous or local breeds. Indigenous chickens appear to have an inherent scavenging and nesting habit (Minga et al. 2004).

Poultry meat production developed from numerous small broiler farms into a well-defined global broiler industry (Baboolal et al. 2012). The increasing demand for poultry meat and eggs in many parts of the developing world favours the industrialization of production systems (Khanum and Ahmed 1997). The poultry sector is the most industrialized of all forms of livestock production, and large-scale production is now widespread in many developing countries. In spite of farming and supplying processed food to poultry, a huge burden of parasites are observed in poultry of Bangladesh.

The domestic chicken is exposed to environmental condition which involves a high risk of parasitism. Poultry basically scavenger and subsists on waste grains and other foods like worms, maggots, insects, cow/buffalo dung, kitchen waste, viscera of other animals etc. Humans get automatically infected at the time of eating the infectious and uncooked flesh of chickens. Birds, like all other animals, too suffer from a wide range of maladies (Rahman et al. 1989). Birds having access to outdoor areas have a greater diversity of ecto and endo-parasites (Pandey et al. 1992, Dar and Tanveer 2013, Khanum 1997). Gastrointestinal parasites constitute a major factor limiting productivity of the poultry industry by affecting the growth rate of the host results in malfunctioning to organs and eventually death. The parasitic diseases occur due to the infection of nematode parasites such as Strongyloides sp., Capillaria annulata, Heterakis spp., Ascardia galli, etc. Among trematodas mostly found parasites are Echinostama revolutum, Prosthogoinous vitellatus, Catatropis verracosa and among cestoda mostly found parasites are Cotugnia digonopora,
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Raillietina echinobothridia, Hymenolepis rustica etc. (Khanum 1974). Epidemiological studies on the prevalence of important parasitic diseases in poultry would provide strategic and tactical principles of parasite control. But epidemiological research on the prevalence of parasitic diseases is scanty and haphazard in Bangladesh.

MATERIAL AND METHODS

The study was conducted from March 2013 to February, 2014. The host animals were domestic fowl, white leghorn, layer and cock. These chickens were collected from New Market and Polashi bazaar of Dhaka city.

Trematode, cestode and nematode were fixed (Cheeshbrough 2004) were fixed with favorable both in alcohol-formal-acetic (A. F. A.) and glacial acetic acid. Both the fixatives were used in hot condition; the only clearing agent lactophenol was used for trematodes. The worms were studied as temporary where mounts in lactophenol. Staining the worms were needed, the worms were dropped in a considerable amount of borax carmine without being diluted with lactophenol. In the present observation, collected parasites were identified according to the descriptions and figures given by Yamaguti (1958, 1959, 1961), Soulsby (1969), Cheng (1985), Khanum (1974).

RESULTS AND DISCUSSION

It has been observed that the intensity of cestode parasite was high compared to other groups. From 20 domestic fowl 250 parasites were collected from the digestive tract, among them, 24 were trematode, 148 cestodes and 78 nematodes. The percentage of each parasitic groups were; trematode 9.6, cestodes 59.2, nematodes 78.

Prevalence and intensity of helminth parasites in domestic fowl: The prevalence of trematode group was the lowest among helminth infestation in domestic fowl. The prevalence of Catatropis verrucosa was 25% and the intensity was 4.8. Cestodes were common parasites in domestic fowl. All of the fowls were infected either by one or more species of cestodes. Three species of cestodes were recorded from domestic fowl, Raillietina echinobothrida was the common species of cestodes. Prevalence of each cestode parasites was Amoebotaenia sphenoides at 10%, Hymenolepis cantaniana at 35% and Raillietina echinobothrida at 55%. The intensity of Hymenolepis cantaniana at 7.57 ± 1.8 (Sd), was highest. The intensity of other cestodes were; Amoebotaenia sphenoides at 1.5 ± 0.5 (Sd) and Raillietina echinobothrida at 6.90 ± 2.2 (Sd). Nematodes were also common parasites of domestic fowl. In this observation
two species of nematodes were found, *Ascardia galli* was the most common nematode parasite of domestic fowl. The prevalence of *Ascardia galli* was at 70% and intensity was at 2.5 ± 1.2 Sd. The prevalence of *Heterakis gallinarum* was 30% with 43 ± 2.5 intensity (Fig. 1). Correlation (r) between prevalence and intensity (r = 0.101, p = 0.850).

Prevalence and intensity of helminthes infestation in white leghorn: In white leghorn, prevalence and intensity of helminth parasites were low. Only *Rallietina echinobothrida* and *Ascardia galli* were recorded in white leghorn. Out of 20 only four hosts were infected by *R. echinobothrida* and the prevalence and intensity was accordingly 20% and 4 ± 1.2. The prevalence of *Ascardia galli* was 35% and the intensity was 2.71 ± 0.8 (Fig. 2). Helminth infestation in white leghorn was very low. Total number of parasites were 35, among them cestodes were 16 and nematodes were 19. The percentage of cestodes and nematodes were accordingly 45.71 and 54.29. The p-value of cestodes and nematodes was (0.6164, p > 0.1) which was insignificant.

Prevalence of different parasitic groups in layer: It has been observed that in layer only cestodes and nematodes are found. Total number of parasites was 149. Among them cestodes were 122 and nematodes were 27. Percentage of cestode group was 81.88 and the percentage of nematode group was 18.12. In
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layer, intensity of helminth parasites were low and *Rallietina echinobothrida* and *Ascardia galli* were collected from layer. Out of 20 layer examined, only 11 hosts were infected by *Rallietina echinobothrida*. The prevalence and intensity of *Rallietina echinobothrida* were accordingly 55% and 11.09 ± 2.4. The prevalence of *Ascardia galli* was 60% and the intensity was 25 ± 0.8.

![Fig. 2. Prevalence and intensity of helminthes infestation in white leghorn.](image1)

![Prevalence and intensity of helminth infestation in cock](image2)

*Prevalence and intensity of helminth infestation in cock:* Cestodes were common parasites in cock. All of the observations were infected either by one or more species of cestodes. *Rallietina echinobothrida* was the common species of cestodes. Prevalence of each cestode parasites were *Hymenolepis cantaniana* (10%), *Rallietina echinobothrida* (40%) and *Cotugnia digonopora* (20%). The
intensity of *Rallietina echinobothrida* (11.87 ± 2.8) was highest. The intensity of other cestodes were; *Hymenolepis cantaniana* (11.5 ± 2.5) and *Cotugnia digonopora* (4.25 ± 1.2).

![Fig. 4. Prevalence and intensity of helminth infestation in cock.](image)

**Organal distribution of helminth parasites in domestic fowl:** Six species of helminths were collected from different parts of the digestive tract. Highest number of parasites were collected from intestine. Three species (two cestode and one nematode) were recorded from intestine. *Amoebotaenia sphenoides* was observed in both duodenum and intestine. *Catatropis verrousa* was collected from caecum and rectum. No helminthes were in proventriculus and rest of the parts of digestive tract. Only two species were collected from white leghorn. The recorded species were *R. echinobothrida* and *Ascardia galli*. These species were recorded from intestine. No helminthes were found in proventriculus and rest of the parts of digestive tract.

**Organal distribution of helminth parasites in layer and cock:** Only two species were collected from layer. The recorded species were *Rallietina echinobothrida* and *Ascardia galli*. These species were recorded from intestine. No helminthes were found in proventriculus and rest of the parts of digestive tract. Five species of helminths were collected from different parts of the digestive tract. Highest number of parasites were collected from intestine, *Cotugnia digonopora, Hymenolepis cantaniana* and *Rallietina echinobothrida* were recorded from intestine *Ascardia galli* was observed in both duodenum and intestine. *Heterakis gallinarum* was collected from caecum. No helminthes were observed in proventriculus and rest of the parts of digestive tract.
Organal distribution of helminth parasites in white leghorn: Only two species were collected from layer. The recorded species were *Rallietina echinobothrida* and *Ascardia*. No species were recorded from upper part of the alimentary canal such as oesophagus, crop, proventriculus and gizzard. Most of the parasites were restricted to the small intestine, particularly the duodenum where there is optimum concentration of saline and glucose (Fatihu *et al.* 1991). While, Khanum (1974) reported 21 species of helminthes from different parts of the digestive tract including crop, caecum and rectum. Pal *et al.* (1985) examined 1568 intestine of domestic fowl and reported that 80.61% were infected with helminthes in Punjab (Pakistan). Ilyes *et al.* (2013) reported 88.19% prevalence of helminth parasites in his work in Algeria. Rabbi *et al.* (2006) worked on gastrointestinal helminthes infection in different types of poultry and reported prevalence of different species of gastrointestinal helminths was highest in backyard poultry (100%) followed by layer (48.75%) and broiler (3.75%). In the present observation, the prevalence of gastrointestinal helminths were highest in backyard poultry (75%) and cock chicken (75%), layer hen (65%) and lower in broiler (35%).

Comparison on helminth infestation between domestic fowl, white leghorn, layer hen and cock: The result of this study showed that the domestic fowl were heavily parasitized. Mixed infections were also encountered and most with nematode. Yoriyo *et al.* (2005) reported high prevalence of the helminth parasites. Previous studies have attributed this high endemicity to poor sanitary conditions and lack of health services (Eshetu *et al.* 2001). In the present study, *Ascaridia galli* having a remarkable prevalence of 70% and this is in agreement with earlier findings of Yoriyo *et al.* (2008). The reasons being that nematodes generally do not require intermediate hosts and at the same time they are soil transmitted parasites. Lower prevalence of helminth infestation and a few number of parasites in white leghorn and layer chicken is expectable because they are reared in a confinement, served processed food and in hygienic condition.

The differences in the worm burden could be attributed to climate difference, availability of intermediate host, and possibly host factors such as host immunity (Khanum 1987). Parasitic intervention to limit hallmark complication of the infection is thus necessary in poultry industries. Zabbar (1992) reported that infection of trematode were - 46% while, cestodes and nematodes 100%. Ashenafi *et al.* (2004) reported that prevalence of cestodes were - 86.32% and nematodes 75.79% in local chicken of central Ethiopia.

The parasitic infection in hosts depends on different factors e.g. pH, temperature, availability of suitable intermediate hosts, flora, water, etc. This is
obviously more true in the case of parasitic infestation which involve intermediate hosts. In all present seasons suitable intermediate hosts are not available.

**CONCLUSION**

As domestic fowls are exposed to natural environment and adapted to variety of foods and lives in non hygienic and contaminated conditions, they are easily infected by parasites. Digested or partially digested foods of the hosts are shared by different species of helminthes, but white leghorns, layer chicken and cock chicken in farm are served of controlled foods and pure drinking water, so there is less chances for parasitic infestation. If the domestic fowls are domesticated in such a way like farm poultry there is possibility to prevent the loss of protein which occurs due to helminth infection.

**LITERATURE CITED**


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