

PREVALENCE OF CESTODE PARASITES OF *GALLUS GALLUS DOMESTICUS* FROM SOLAPUR DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT

Cestode parasites of 80 *Gallus gallus domesticus* in Solapur District, Maharashtra were identified. The period of survey was from in February 2011 to January 2012. Sixty five cestodes were collected from alimentary canals of 80 slaughtered birds, belongs to family Phasianidae. Cestode parasites were of Cyclophyllideans distributed mainly in the families' Davaineidae. This report summarized the data, demonstrates the utility of monitoring tapeworms in birds to identify the risk of infection.

KEY WORDS: *Gallus gallus domesticus*, Cestode, Survey.

INTRODUCTION

Tapeworms affected birds, produce droppings of varying consistency 10-12 days after ingesting infective eggs or an intermediate host. Appetite is initially increased, but diminishes as infestation progresses. Heavily infested birds usually show impaired general condition and are listless, apathetic with dull, ruffled plumage, loss of their weight, anemia and leg weakness. The resulting debility may pave the way of infections and other diseases. The intermediate host may be an earthworm, snail, slug, insect, fish, or other creature which is edible to bird host, digestion of the tissues released the bladder-worm in the gut, which then gives rise to one more adult tapeworms. Avian cestode faunas in India have been poorly studied. Only 15 species of tapeworms have been reported from avian hosts in Western Maharashtra (Kharade, 1992; Pokale, 1992; Bandgar, 1992). The family Davaineidae (Braun, 1900), Dilepididae (Railliet and Henry, 1909), Hymenolepididae (Spassky, 1954), Taeniidae (Ludwig *et al.*, 1886) and Dioecocestidae (Southwell, 1922) are widely distributed avian cestode parasites in this region. The avian cestodes were found out by Fuhrmann (1908); later on Meggitt (1927) made a revision for particular genera such as *Davainea*, and *Cotugnia*. We initiated a study of avian cestode fauna of this region with the goal of developing an inventory of species diversity for these poorly known organisms in a region that has received little attention from Parasitologist. We examined 80 slaughtered *Gallus gallus domesticus* bird intestines, in February 2011 to January 2012.

The systematic study of some cestodes derived from these collections has been treated previously by Hiware and Jadhav (1994) and Jadhav *et al.* (1994). The literature on the avian cestodes in India, contains several data relating of findings the authors: Ashfaq *et al.* (1992), Balmani and Rao (1995). The credit of faunistic treatise a cestode parasite from avian hosts from particular countries of localities is due to the following authors: Luhe (1910) were examined cestodes of Germany. The avian cestodes of the Ivory Coast was reported Mariaux (1994), in Slovakia, Hanzelova and Pysavy (1996), Yamaguti, (1940). The present article summarized the overall results of these collections and documents new information for host-parasitic distribution of this poorly known avian cestode fauna.

MATERIAL AND METHODS

Study area and sampling: The cross sectional study was carried out in the Solapur District, Maharashtra, India. A total of 80 slaughtered domestic fowl esophagus, stomach and intestines of different age groups and of both sexes were randomly selected from the area under study over a two period from February 2011 to January 2012. No birds were purchased from a single household during the entire period of study.

For present study the methods were used previously described by Mariaux and Vaucher (1989). Cestodes were removed from the dissected gut with forceps, fixed with hot 4% formalin, stained with Haematoxylin, and mounted in DPX, then determined.

Parasitological examinations

Examinations were performed by standard methods. Briefly, after decapitation, the entire gastrointestinal tract was collected from each bird. The gastrointestinal tract was opened in a longitudinal section and the contents were carefully washed through a 100 µm test sieve. The mucosa was scraped in order to collect the cestodes embedded in the mucosal layer. Finally, the contents were also examined under a microscope for locating any larvae or egg invisible to the naked eye. All cestodes were counted before being fixed. Permanent slides of the scolices were prepared to identify the cestodes as per Soulsby (1982).

Statistical analysis

The following formula was used for to calculate Prevalence percentage, Mean intensity and Abundance:

*Prevalence = number of individuals of a host species infected with a particular species / number of hosts examine

**Mean Intensity = total number of individuals of a particular parasite species in a sample of hosts / total number of individual as of the host species in the sample.

#Abundance = total number of individuals of a particular parasite species in a sample of a host species / number of infected individuals of the host species in the sample.

RESULTS AND DISCUSSION

Of 80 birds intestine are examined, 46 or 57.5% had infected with 2 species of tapeworm infection. A synoptic overview of these collections is presented with complete host parasite list based on the material that has determined at least to generic level was showed in Table 1. In figure 1A showed that the prevalence percentage, mean intensity (Figure 1B) and abundance (Figure 1C) of cestode parasites of *G. gallus domesticus*. Infections were usually due to single species of parasites 81.82%, where as 18.18% mixed infection and 0% triple infection were noted.

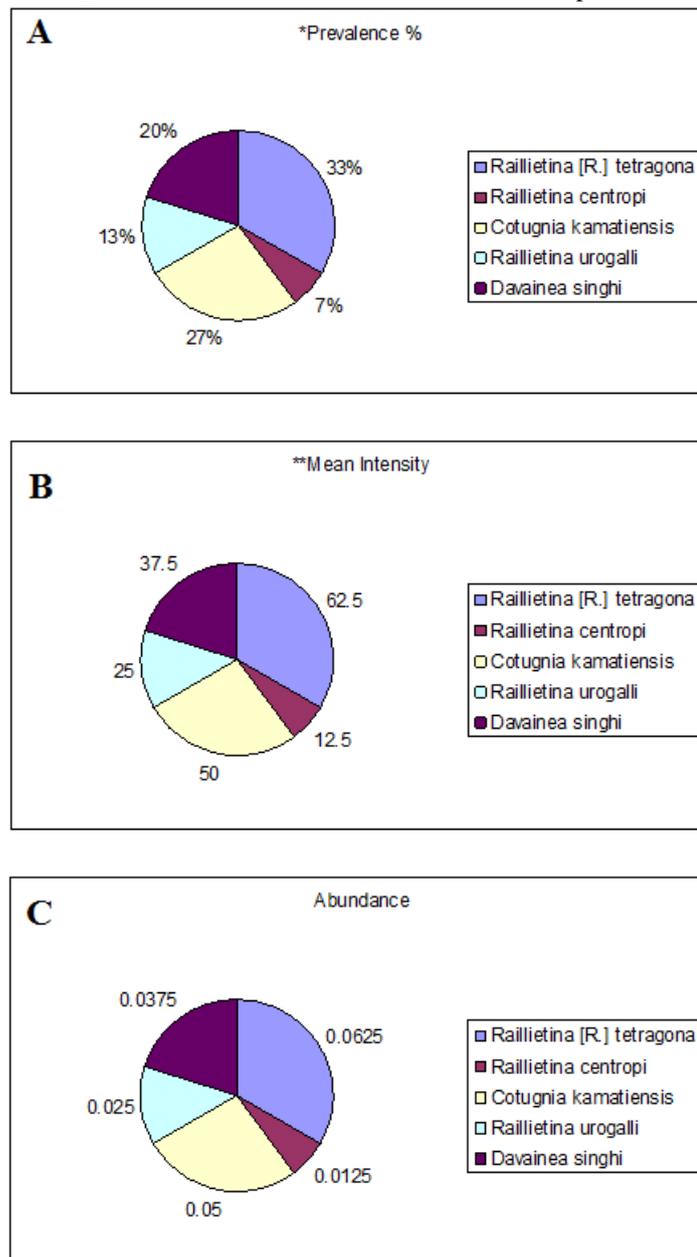


Figure-1. A. Prevalence percentage of cestode parasites of *Gallus gallus domesticus*.

B. Mean intensity of cestode parasites of *Gallus gallus domesticus*.

C. Abundance of cestode parasites of *Gallus gallus domesticus*.

Table 1. Systematic survey of *Gallus gallus domesticus* parasites from Solapur District, Maharashtra State, India.

Sr. No.	Parasite species	*Prevalence %	**Mean Intensity	Abundance
1	<i>Raillietina [R.] tetragona</i>	33	62.5	0.0625
2	<i>Raillietina centropi</i>	07	12.5	0.0125
3	<i>Cotugnia kamatiensis</i>	27	50	0.05
4	<i>Raillietina urogalli</i>	13	25	0.025
5	<i>Davainea singhi</i>	20	37.5	0.0375

At the familial level, most of the important groups of collected cestode parasites are under family Davaineidae shown in Table-1 and Figure 1 A, B and C.. Infections were usually due to single species of parasites 81.82%, where as 18.18% mixed infection and 0% triple infection were noted. The cestode parasites, their emergence is dependent on suitable intermediate host (snails, beetles, ants), which they require in order to develop. Birds only become infected if they ingest an intermediate host.

The infected birds lose weight, increases appetite and ruffled plumage. If cestodes of birds continue to spread, rapid detection will be an important public health issue. Since cestodes attacks various internal organs in birds, gut and fecal samples from birds can be used to detect the tapeworms in surveillance programme. Our findings, consistent with those of earlier studies, indicate that the gut is the most frequently and sensitive target organ (of those tested) from birds for detecting the infection of cestodes. The present study enabled to survey 3 genus and 5 species of cestode parasites, its identification on the basis of their scolex, mature and gravid segments. The collected cestodes in the family Davaineidae were compared with the observations by Shinde and Ghare (1977). The species composition of the fauna from the Solapur District was particularly diverse and interesting. The most notable aspect of fauna structure was relatively high proportion of worms belonging to family Davaineidae. This family originally erected by Braun (1900). The survey, isolation of lipid and antihelminthic and chemotherapeutic activity on cestode parasites of *G. gallus domesticus* in Maharashtra State, India were observed by Jadhav and Dama (1997), Dama and Jadhav (1997, 1998), Dama et al., (1998), Dama and Kirdak (2002).

Many avian species can become infected with tapeworms, but the prevalence of infection for each species is unknown without systematic gut surveys of the bird population. It is also unknown which birds have high enough cestodosis for efficient transmission to the vector. The apparent mortality rate caused by cestodes is higher for hen *Gallus domesticus* than for other birds, but laboratory experiments are required to determine the cestode mortality rates and the pathogenic mechanisms in hens and other avian species.

Gastrointestinal, meal identification and transovarial transmission studies for their potential intermediate hosts in which larval stages develops, are also important research areas. The spread of avian cestodes across the globe call for international cooperation in developing effective antihelminthic drugs and planning innovative strategies for controlling intermediate hosts. To prevent cestode infection in birds, extensive early season larval control has been recommended and undertaken, as the development and discrimination of avian health.

The infected birds lose weight, increases appetite and ruffled plumage. If cestodes of birds continue to spread, rapid detection will be an important public health issue. The present study enabled to survey total 2 species, its identification on the basis of their scolex, mature and gravid segments. The high prevalence rate of the cestode family Davaineidae. The spread of avian cestodes across the globe call for international cooperation in developing effective antihelminthic drugs and planning innovative strategies for controlling intermediate hosts. To prevent cestode infection in birds, extensive early season larval control has been recommended and undertaken, as the development and discrimination of avian health.

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