

## Histopathological and Seasonal variation study of *Cotugnia aurangabadensis* in *Gallus domesticus*

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### ABSTRACT

Histological and seasonal study reveals the infection efficiency and pathogenicity among the infected animal. This study shows the infection of cestode parasite *Cotugnia aurangabadensis* on *Gallus domesticus*. This infection indicates the pathogenic symptoms on the host. We basically infer the histological changes such as attachment of cestode to the intestinal villi through large rostellum. This brings the local deformities in the intestinal structure and function. Gastrointestinal parasitic infections are a worldwide problem which results in morbidity and mortality in tropical countries. It caused great economic losses through lowered fertility, reduced work capacity, involuntary culling, and reduction in food quality, and meat production, treatment costs and mortality in heavily parasitized animals. The prevalence of gastrointestinal parasites, the genera of cestode parasites involved, species and the severity of infection also vary considerably depending on local environmental conditions such as humidity, temperature, rainfall, vegetation and management practices.

**Key words:** Cestode, Rostellum, Pathogenicity, Gastrointestinal, etc.,

### INTRODUCTION

In low to moderate infections, pathological effects are localized around the attachment of the adult worm. The extent damage is proportional to the depth of penetration of the scolex. It is negligible when parasites are attached to the epithelial mucosa only and becomes extreme, with extensive granuloma and subsequent fibrosis, when the scolex is anchored in the muscle layer or entirely perforates the intestinal wall (Paperna & Zwerner, 1976, McDonough & Gleason, 1981, Kabata 1985).

At the same, it is known that tapeworm ingest nutrition by digesting the intestinal content and partially by damaging the intestinal wall with the help of their proteolytic enzymes while they protect themselves from the

effect of host-produced proteolytic enzymes with their protease inhibitors (Mackiewicz et al. 1972) supposed that proteolytic enzymes or other lytic secretion played a role in pronounced tissue reaction.

The seasonal variation of gastrointestinal helminthic infection shows the higher prevalence of parasites in monsoon (93%) followed by winter (74%) and summer (74%). The higher incidence of parasitic infection occurs in rainy season because too easy dispersal of larvae in pasture resulting in increased contact between the host and the parasites from the results of the studies on incidence of different types of helminthic infection, it is clear that the cestode parasites are predominated during all the seasons with 262 (43.67%) followed by Nematode parasites with 125 (20.83%) and Trematode parasites with 75 (12.50%). Higher incidences of cestode parasites may be due to conducive environment for growth of the parasites. The present study indicates that the occurrence of helminthic infection depends on suitable environment which require in its development. Padwal et al., (2007). Environmental variations were reflected in seasonal difference in the incidence of diseases. The existence and survival of parasite is greatly influenced by pollution of the environment the development of parasites need high temperature and sufficient moisture. The high prevalence occurs in summer followed by winter season (Jadhav and Bhure 2007).

The influence of diet on such clumped helminth distribution is ruled out. This conclusion is based on the reason because the general occurrence of a large number of intermediate arthropod hosts that breeding season of poultry enabled the availability of infective larvae to all the birds, irrespective of sex of birds. But still, the female domestic fowls exhibited greater prevalence of tape-worm infection during breeding season than male birds. The evidence provided by the earlier investigation of Von brand (1966), and Malhotra (1983) have demonstrated that the physiological resistance in female avian hosts might decline during breeding season, resulting thereby, in an increased invasion of a variety of helminthes in female birds compared to the male birds. A correlation of seasonal fluctuations in atmospheric temperature with distribution of cestodes. Chincholikar and Shinde (1976) provided evidences of greater influence of female sex on survival rate of *Heterakis gallinae* that of male sex in natural female chicken populations in

Bulgaria. The consumption of increased invertebrate populations by laying female *American woodducks* during egg production and hyperphagia were identified to be the main reasons for increased invasion of female avian hosts by a variety of helminthes during breeding.

## MATERIALS AND METHODS

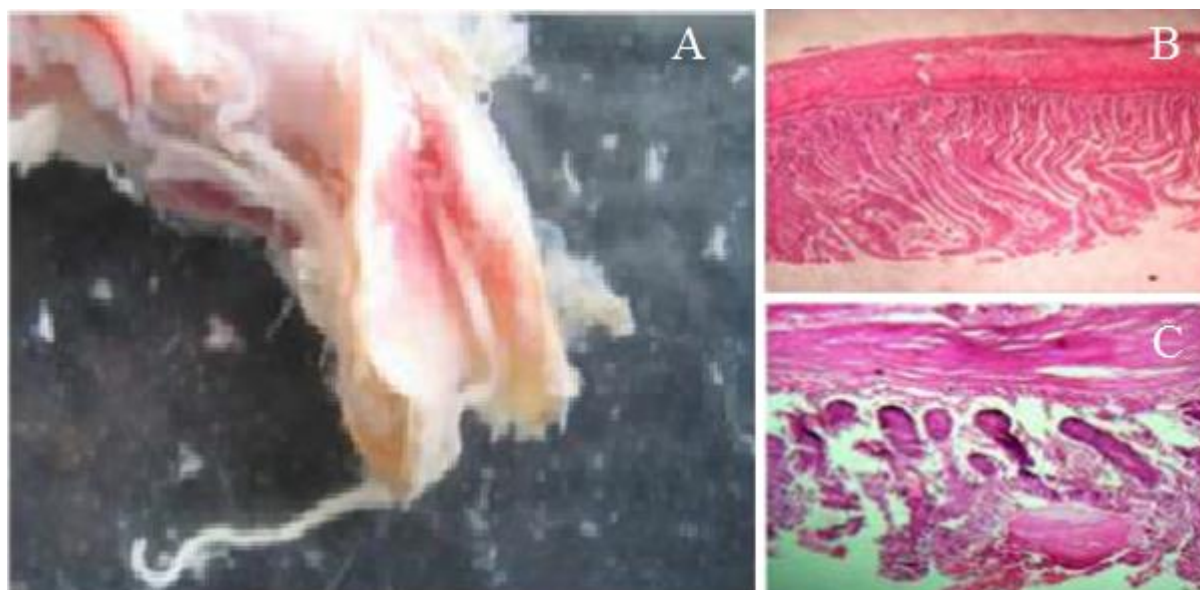
The digestive tracts were carefully examined. Cestodes were collected and a complete record about the infected host, parasites is summarized. The parasites were flattened and kept in 4% formalin, stained by Harris-haematoxylin, mounted in DPX and identified for further observations.

The survey was carried out during the period of June 2013 to May 2014, at various places of Amravati Region viz. Akola, Buldhana, Amravati, Chikhali, Deolgaon Raja, the hosts examined for a year, were *Gallus domesticus* for cestode parasites. The poultry Birds were surveyed. The digestive tract of *Gallus domesticus* collected from slaughter houses

## RESULTS AND DISCUSSION

**Histopathological sections from intestine of *Gallus domesticus* (Linnaeus, 1758) infected with cestode parasite (*Cotugnia aurangabadensis*, Shinde, 1969.)** Scolex of *Cotugnia aurangabadensis* Shinde, 1969 attached to the intestinal villi through large rostellum. The scolex of this worm is non-penetrative type, so the worm invades only the villi but not the crypts of Lieberkuhn. So, the attachment is superficial. Mature and gravid proglottids of the strobila are not attached to the wall of intestine and found freely suspended in the lumen of intestine. Cyst is encircled with connective tissue sheath and located deep in the submucosa, just above the muscularis externa. Few gravid segments were also found in posterior part of intestine. (Chincholikar,1976).

In this study, important parasites of vertebrates such as poultry birds were identified and those factors affecting the epidemiology of these parasite. High levels of prevalence, intensity and abundance of these parasites were generally observed around the rainy season. Thus, confirm that the weather conditions of the wet seasons were generally favorable for the

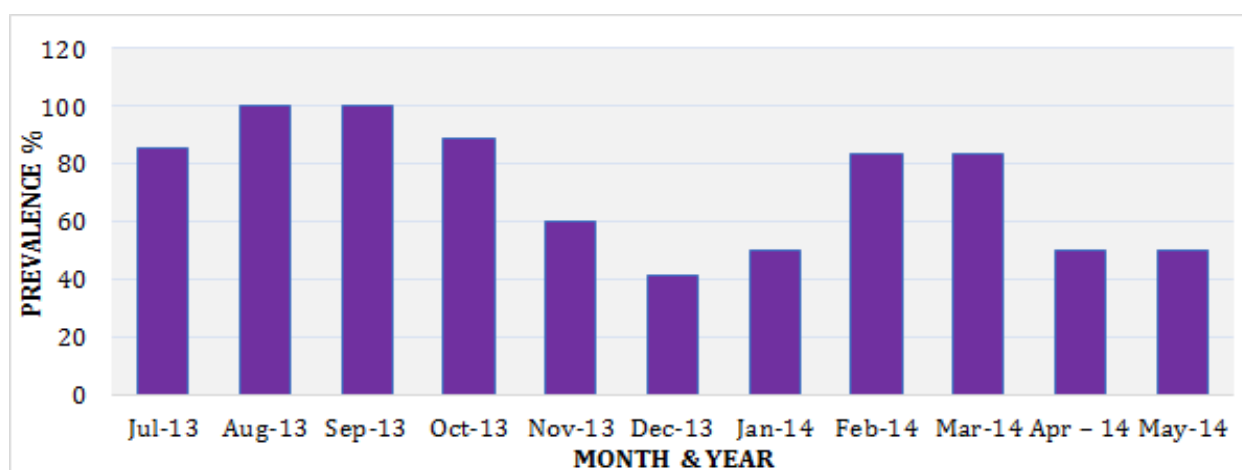


**Fig. 1:** Histopathology of *Cotugnia aurangabadensis* (Shinde, 1969)

**A:** Attached cestode parasite; **B:** Non infected intestinal tissue; **C:** Infected Intestinal tissue

**Table 1:** Seasonal Variation of *Cotugnia aurangabadensis* (Shinde, 1969) from *Gallus gallus domesticus* (Linnaeus, 1758) during the year 2013-14 from "Amravati Region"

Sr. No.	Month & Year	No. of dissected hosts	No. of infected hosts	No. of Cestode parasites collected	Prevalence %	Genera	Locality
1	Jul-2013	7	6	8	85.71	<i>Cotugnia</i>	Akola
2	Aug-2013	6	6	7	100	<i>Cotugnia</i>	Chikhali
3	Sep-2013	5	5	9	100	<i>Cotugnia</i>	Buldhana
4	Oct-2013	9	8	10	88.89	<i>Cotugnia</i>	Deolgaon raja
5	Nov-2013	10	6	6	60.00	<i>Cotugnia</i>	Deolgaon raja
6	Dec-2013	12	5	5	41.67	<i>Cotugnia</i>	Deolgaon raja
7	Jan-2014	8	4	5	50.00	<i>Cotugnia</i>	Akola
8	Feb-2014	6	5	5	83.33	<i>Cotugnia</i>	Chikhali
9	Mar- 2014	6	5	5	83.33	<i>Cotugnia</i>	Amravati
10	Apr - 2014	8	4	4	50.00	<i>Cotugnia</i>	Akola
11	May - 2014	8	4	4	50.00	<i>Cotugnia</i>	Buldhana



**Fig. 2 :** Seasonal Variation of *Cotugnia* (Shinde, 1969) from *Gallus gallus domesticus* (Linnaeus, 1758) during the year 2013-14 from "Amravati Region"

development, survival and transmission of the free-living stages of cestode. The present studies also demonstrated the roles of other factors such as age, sex and susceptibility of host.

Bird rearing is traditionally practiced in Amravati Region, M.S. (India), has to cope with many constraints, especially health related. In order to contribute to the knowledge of avian diseases in the area and to undertake improvement in traditional bird keeping, a parasitological investigation based on examining intestine and survey of cestode species was carried out for a year. Birds are characterized by relatively diverse and abundant communities of intestinal helminthes, especially cestodes, which may be related to the opportunistic habits.

The highest incidence of prevalence was observed in the period of Jul-2013 to Oct - 2013 and also Feb and Mar- 2014 of *Cotugnia* Shinde, 1969 *Sp.* in the year 2013-2014.

**Conflicts of interest:** The authors stated that no conflicts of interest.

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