



BIODIVERSITY AND PREVALENCE OF CESTODE PARASITES IN FOWL FROM DHULE REGION

D. R. Patil*, A. T. Kalse, P. D. Patole* and G. A. Malthane***

*Department of Zoology,

B.S.S.P.M's Arts, Commerce and Science College, Songir, Dhule

**PG Department of Zoology, Nanasaheb Y. N. Chavan

Arts, Science and Commerce College, Chalisgaon, Dist. Jalgaon

Corresponding Author Email :- devendrapatil288@gmail.com;

charuajit@gmail.com

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ABSTRACT:

Biodiversity is the biological variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic, species and ecosystem level. Gastrointestinal parasitism is a major constraint for livestock production causing heavy economic losses. Studies from different parts of India indicate that variation in the prevalence of parasitic infections from region to region is largely due to climatic factors and the availability of vectors in vector-borne infections. So far no study on seasonal variation in *Gallus gallus domesticus* in North Maharashtra especially in Dhule region is carried out. This study is an effort to determine the biodiversity and seasonal prevalence of cestode parasites in Fowl during monsoon, winter and summer season for the year June 2011 to May 2012. During June 2011 to May 2012, 210 host intestines were examined in which 109 infected intestines were observed and from these intestines total 273 cestode parasites were collected. The incidence, intensity and density of infection were found to be 51.90 %, 2.50 % and 1.30 % respectively.

Keywords:- Biodiversity, Cestode, prevalence, Dhule region, Genera, seasonal variation

INTRODUCTION :

Domestic fowl is one of the most common and wide spread domestic animal that act as source of meat, eggs, feathers and organic manure of high fertility. Poultry production has emerged as a check and balance on the rising prices of meat. However parasitism presents a main threat to the indigenous poultry production of meat and eggs. The domestic fowl infected with cestode shows retarded growth, decreased eggs production, reduced weight gain and significant hemoglobin depression. The incidence of cestode infection varies with age, sex, season and agro-climatic conditions. Domestic birds are highly susceptible to infection with large number of internal parasite specially helminthes one. In heavily parasitized young birds, the common manifestation are stunted growth, emaciation, weakness and death in young, while in laying hen the egg production was lowered. The

cestode inhabits the small intestine and causes stunted growth of young chickens, emaciation of the adult, decreased egg production of the hen. The common internal parasitic infection occurs in poultry includes gastrointestinal helminthes. Effective parasite control strategies, including regular deworming and good hygiene practices are essential to minimize the impact of parasitic infections in fowl.

MATERIALS AND METHODS:

The study of biodiversity and prevalence of cestode parasites irrespective of age, sex, and breed, a total number of 210 intestines of *Gallus gallus domesticus* were collected from the different region of Dhule District during June 2011 to May 2012. All the tapeworms were collected from the intestine of naturally infected domestic fowl, washed in distilled water to render them free from intestinal contents, rinsed quickly 3-4 times in normal saline. The



tapeworms were then carefully flattened, stained and identified for taxonomical study. Simultaneously the number of infected and non-infected host intestine and number of parasite found were recorded for the study of seasonal variation.

Data was collected month wise and the Incidence, Intensity and Density of Cestode parasites were calculated seasonally.

Incidence of Infection = $B \times 100/A$

Intensity of Infection = C / B

Density = C / A

Where, **A** stands for number of host examined, **B** stands for number of host infected and **C** stands for number of parasites collected.

The overall percent of infection with *Railietina* was 165 (60.43%) and that of percent infection of *Krimi* was 60 (21.97%) and the species *Cotugnia* was 48 (17.58%).

From the recorded data, it also focuses on the incidence, intensity and density of infection in Cestode parasites of fowl. The incidence of infection was 51.9 %, intensity of infection was 2.5% and density of infection was 1.3%.

From the recorded data, It also shows that, the incidence, intensity and density of infection in genera *Railietina* is highest, then it is followed by genera *Krimi* and very lower in *Cotugnia* respectively.

The seasonal variation of cestode parasite infection for three seasons i.e. monsoon, winter and summer shows that, the higher incidence of infection occurs during winter season followed by monsoon and summer season respectively, while intensity of infection occurs during summer season followed by monsoon and winter season respectively and that of density of infection occurs during monsoon season followed by winter and summer season respectively.

RESULT AND DISCUSSION :

The present study indicates that the infection with cestodes is a frequent phenomenon among the domestic birds (*Gallus gallus domesticus*). The results show a high prevalence during **June 2011** to **May 2012**. Generally the environmental factor and feeding habitats are influencing that seasonality of parasitic infection either directly or indirectly, which provide good conditions for many GI parasites to flourish. In the present study 3 genera of cestode namely *Railietina*, *Cotugnia* and *Krimi* were identified.

The result show highest prevalence in winter season (57.14%), followed by monsoon season (55.88%) and low in summer season (43.05%) which is similar to the observation of Bhure (2010), Tambe (2011), Padwal (2011) and Shukla (2012), recorded. Most of the findings so far are recorded on the basis of seasonal prevalence. According to Kennedy (1976) the temperature, humidity and rainfall, feeding habits of host, availability of infective host and parasite maturation, and such factors are responsible for influencing the parasite infections. It show highest prevalence during summer seasons followed by winter seasons where as low prevalence were reported during monsoon seasons which is similar to the observation of Pennuyuick (1973), Jadhav (2006) and Bhure (2013). Naphade (2013) also show highest prevalence during summer, followed by rainy season and lowest during winter.

From above record from various part of the world indicates that climatic condition of that particular area play an important role in the dispersal of parasites population Gordon et.al. (1982). Parasitic cestodes in poultry are known to cause retarded growth, enteritis, diarrhea and haemorrhages Soulsby, (1982). It also indicates that, the difference in climate influences the life cycle of worms, which might be explained by the presence of favorable microenvironment for the

survival and transmission of the infective larval stages and egg of the parasite.

Heavy infections may cause death of young birds apart from the loss of egg production in laying chickens. *Raillietina echinobothrida* and *Raillietina tetragona* are considered to be harmful to chicken. Shukla et al., (2012) investigation indicate that the maximum prevalence of *Raillietina* parasite of *Gallus gallus domesticus* has occurred in winter season followed by rainy whereas minimum prevalence occurred in summer season. Bhure et al., (2010) and (2012) also recorded similar investigation that indicate the higher prevalence in winter followed by summer and while low in monsoon. Permin (2003), all tapeworms of poultry have indirect life cycles with intermediate hosts such as earthworms, beetles flies, ants or grasshopper, the intermediate hosts are essential to perpetuate the life cycle and infection are rare in indoor system. Anwar et al., (2000) the chickens infected with cestode parasites show loss of appetite, diarrhea, weight loss and decreased egg production. The lesions included the villous atrophy and desquamation of epithelium, catarrhal enteritis, granuloma formation in duodenum, congestion, cellular infiltration, desquamation of sub mucosal glands and hemorrhagic exudates.

CONCLUSION :

The incidence of parasite occurs during winter season because of the suitable climatic conditions and the availability of food i.e. pastures during their development. The prevalence of these cestode parasites varies considerably depending on local environmental conditions such as humidity, temperature, rainfall and management practices. It is well recognized that in resource poor regions of the world health infections of fowls are major factors responsible for economic losses through reduction in productivity and increased mortality, Over et al., (1992). In monsoon season

the intensity of infection of parasites occur comparatively less to summer season.

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Table: 1 - Table showing recorded data of Cestode species from June 2011 to May 2012

Sr. No.	Month & Year	No. of Intestine examined	No. of infected Intestine	No. of Cestode collected	No. of <i>Raillietina</i> found	No. of <i>Krimi</i> found	No. of <i>Cotugnia</i> found
1	June 2011	18	08	15	10	02	03
2	July 2011	20	11	24	16	04	04
3	Aug. 2011	17	09	27	18	05	04
4	Sept. 2011	13	10	34	18	09	07
5	Oct. 2011	15	08	18	08	06	04
6	Nov. 2011	20	13	29	17	06	06
7	Dec. 2011	19	11	23	16	04	03
8	Jan. 2012	16	08	19	12	03	04
9	Feb. 2012	19	09	27	17	06	04
10	Mar. 2012	18	08	19	11	05	03
11	Apr. 2012	16	07	16	10	04	02
12	May 2012	19	07	22	12	06	04
13	Total	210	109	273	165	60	48

Table 2: - Table showing incidence, intensity and density infection of cestode parasites in the *Gallus gallus domesticus* during June 2011 to May 2012

Sr. No.	Month & Year	No. of Intestine examined 'A'	No. of infected Intestine 'B'	No. of Cestode Collected 'C'	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)
1	June 2011 to May 2012	210	109	273	51.90	2.50	1.3

Table 3: Seasonal variation of Incidence, Intensity and Density of cestode infection during

Sr. No.	Genera	No. of Intestine examined A	No. of Infected Intestine B	No. of Cestode Collected C	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)
1	<i>Raillietina</i>	210	109	165	51.9	1.51	0.78
2	<i>Krimi</i>	210	109	60	51.9	0.55	0.28
3	<i>Cotugnia</i>	210	109	48	51.9	0.44	0.22

Table 4: - Table showing seasonal variation of Incidence, Intensity and Density of infection in different genus of cestodes during June 2011 to May 2012

Sr. No.	Season	No. of Intestine examine 'A'	No. of infected Intestine 'B'	No. of Cestode collected 'C'	Incidence of Infection (%)	Intensity of Infection (%)	Density of Infection (%)
1	Monsoon	68	38	100	55.88	2.63	1.47
2	Winter	70	40	89	57.14	2.22	1.27
3	Summer	72	31	84	43.05	2.70	1.16

