

STUDY OF GENUS *EIMERIA* (*EIMERIA MITIS*, TYZZER 1929) IN BROILER CHICKEN (*GALLUS GALLUS DOMESTICUS*) FROM AURANGABAD (M.S.) INDIA

Nikam S.V.* Jadhav B.N. and Bhamre S.N.*****

*Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University Aurangabad (M.S.), India

**Department of Zoology Shri Muktanand College, Gangapur Tq. Gangapur District- Aurangabad (M.S.), India

***Department of Zoology, K.R.A. College Deola, District- Nashik, (M.S.), India

ABSTRACT

The objective of this study was to investigate the prevalence of coccidiosis in poultry and to identify the species found in the study area. The study included survey, fecal examination of the host, and identification of coccidial species based on their morphology, predilection site in the intestine and sporulation time. Chicken is more susceptible to *Eimeria tenella*, *Eimeria necatrix*, *Eimeria brunetti*, *Eimeria mitis*, *Eimeria acervulina*, *Eimeria praecox*, *Eimeria maxima*. During our investigation three new species i.e. *Eimeria nikamae*, *Eimeria tarabaie*, *Eimeria shivpuri*, were recorded in Broiler chicken from Aurangabad district of Maharashtra.

KEY WORDS: Poultry, Coccidiosis, *Eimeria* Sp.

INTRODUCTION

Coccidiosis is a major problem in poultry worldwide. In our country it causes a huge economic loss to poultry industry, especially in the production of broiler chicken. Avian coccidiosis, an intestinal disease caused by protozoan parasites of the genus *Eimeria*, occurs worldwide ((Ahmad Parvez et al., 2000; Chakravarthy and Kar, 1944; Dubey and Pande 1963; Hegade, 1969; Hein, 1970; Krishnamurthy and Kshirsagar, 1976; Mandal, 1966, 1970 and Sharma, 1966). It is considered to be one of the most economically important diseases of domestic poultry. For many years, prophylactic use of anticoccidial feed additives has been the primary means of controlling coccidiosis in the broiler industry and has played a major role in the growth of this industry. Today country produces about 7.6 billion chickens annually. However, development of resistance in coccidia has threatened the economic stability of the broiler industry. Coccidiosis is believed to be a commonest depreciator or even a potential killer of our poultry. Hence from medical point of view their study is very important. Our study covers survey and species identification of coccidia in chicken.

MATERIALS AND METHODS

The material for the study of coccidia of broiler chicken was obtained from various slaughter houses as well as from different fields in Aurangabad district (M.S.). The different parts of the intestine of slaughtered chicken were examined and preceded within 4-5 hours after collection. The samples were examined for oocyst. Oocysts are separated from fecal material by sieving and centrifugation at 3000 rpm for 10 min. The oocysts collected were spread out in shallow Petri dish in 2.5% potassium dichromate solution for sporulation. Care was taken to aerate them properly to prevent desiccation. The sporulation was carried out in all cases at room temperature (about 28 to 32 °C). The oocysts were examined regularly to check for their sporulation. It was done twice daily. In case of species with shorter sporulation time the checking was done every two hours. The sporulated oocysts were preserved in 2.5% potassium dichromate solution and examined later. Studies were made on the structure of both unsporulated as well as sporulated oocysts. Measurements were done with an ocular micrometer and photograph were taken with 5 mega pixel canon power shot A450 camera using 100 x oil immersion objective and 16x eye piece. The dimensions of the oocysts were based on a study 15 to 30 oocysts picked at random.

RESULTS AND DISCUSSION

During a period of two years i.e. from June 2006 to May 2008, total number of 2524 samples was examined. 734 of these were positive for coccidial infection, the percentage of prevalence being about 29.08%. During the present study ten species of *Eimeria* are found in Broiler chicken. Seven species are already described and three are new species. The commonest was *Eimeria tenella*, *Eimeria necatrix*, *Eimeria brunetti*, *Eimeria acervulina*, *Eimeria maxima*, *Eimeria praecox*, *Eimeria mitis*, *Eimeria nikamae*, *Eimeria tarabaie*, and *Eimeria shivpuri*. *Eimeria mitis* was the seventh species found in 15 out of 734 positive samples representing 2.04% of the positive samples and 0.59% of the total samples.

Description of the oocyst *Eimeria mitis* (Tyzzer 1929)

The oocysts are spherical to sub spherical in shape and covered with thick, dark brownish colored single layered wall, measured about 0.8 µm thick. Micropyle and micropylar cap is absent. The unsporulated oocyst shows spherical granular sporoblast filling entire portion of the oocyst. The sporulated oocyst shows the presence of prominent polar granule near to the oocyst wall. Oocystic residuum is absent. The sporocysts are elongated; oval to egg shaped, and

shows typical arrangement in the oocyst, three in a row and one across all of them. Sporocyst measures about 8.11-12.10 μm in length and 4.9-5.9 μm in width. Posterior end of the sporocyst is rounded, broad, anterior end is narrow, and on its tip prominent Stieda body is present. Sporocystic residuum is absent. The sporozoites are short and stumpy shaped, placed transversely at two ends of the sporocysts having moderate sized refractive bodies.



Figure 1: -Unsporulated oocyst of *Eimeria mitis*



Figure 2: -Sporulated oocyst of *Eimeria mitis*

***The dimensions of the sporulated oocysts are as follows:-**
(All measurements are in microns.)

Particulars	Cyst from broiler chicken
Length of the oocyst	14.1-19.3 (14.8)
Width of the oocyst	13.1-17.5 (15.0)
Length width ratio	1.0-1.1 (1.0)
Length of the sporocyst	8.11-12.10 (11.0)
Width of the sporocyst	4.9-5.9 (5.4)
Length width ratio of the sporocyst	1.6 -2.0 (1.8)

* The frequency distribution of the lengths and widths of the oocysts is shown in fig.1

* **Sporulation time:-**The sporulation time of the oocysts was 18-24 hours

* **Prevalence:** The species was found in 00.59% of the 2524 broiler chicken examined from Aurangabad region (M.S.).

COMMENTS

This species was described by Tyzzer in 1929 in Harvard University. It was subsequently recorded by various workers in the different parts of the world like, Edger and Seibold (1964). In India Gill and Ray (1957) in Calcutta, Pande and Bhatia (1968), Bhatia (1972), Mandal (1975), from Calcutta. Comparisons of the dimensions of the oocysts described here with those of earlier workers are shown in table no.7. The description of the sporulated oocyst given here agrees in general with those of earlier workers. However there are minor variations in the morphometrics.

Table 1.Showing the comparative dimensions of *Eimeria mitis* (based on various authors).

Sr.no.	Authors	Length of oocyst in microns	Width of oocyst in microns	Average
1	Tyzzer(1929)	13-17	14-20	15 x 16
2	Johnson(1938)	12-26	13-18	14 x 15
3	Edger(1955) and Joyner(1958)	15.5-20.7	10.35-18.4	15.8 x 13.8
4	Research report (1973) Univ. of Georgia	14.3-19.6	13.0-17.0	16.2 x 16.0
5	Present author (2008)	14.1-19.3	13.1-17.5	14.8 x 15.0

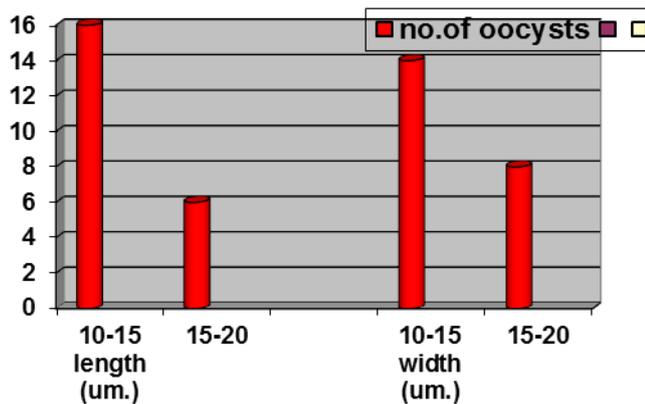


Figure 1. Showing the frequency distribution of lengths and widths of oocysts of *Eimeria mitis* from broiler chicken.

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