



OBSERVATION OF *EIMERIA MAXIMA* IN BROILER CHICKEN IN OSMANABAD DISTRICT, MAHARASHTRA

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ABSTRACT

The present study seven species of *Eimeria* are found in broiler chicken and are redescribed here.

KEY WORD: Coccidiosis, *Eimeria* species, oocysts, Broiler chicken.

INTRODUCTION

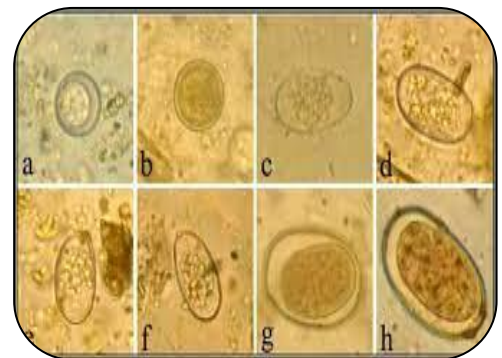
In India studies on Coccidiosis have been relatively scanty. Mandal (1975) in review on "Fifty years progress in the taxonomy of coccidian (Protozoa: Sporozoa) from India", estimated that about 200 species of coccidia spread over seventeen genera were described till then this information is thus very negligible considering the very large size of our country and the endless variety of animals that constitute its fauna. The necessity for basic taxonomy studies is also reflected in the statement of Levine (1973) that "*Eimeria* had been described only from 1.2% of the world's chordates. He also estimated that if all chordates were examined perhaps at least 34000 species of *Eimeria* might be found and that 3,500 of them would be from Mammals.

MATERIAL AND METHODS

The birds (broiler chicken) were sacrificed and various parts of the alimentary canal and caeca were examined. The faecal contents were diluted with water and sieved to remove the large faecal debris, after repeated washing the oocysts were concentrated by centrifugation at 3000 rpm for ten minutes. The oocysts were then spread out in shallow Petri dishes and covered with 2.5% potassium dichromate solution for sporulation. Care was taken to aerate them properly and also 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 up, if they are sporulated. The checking 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 the 2.5% potassium dichromate solution and examine later. Studies were made on the structure of both unsporulated as well as sporulated oocyst. Measurements were done with an ocular micrometer and photograph were taken with 20.1 mega pixel with 8x optical zoom sony cyber-shot DSC-W830 camera using 100 x oil immersion objective and 10x eye piece.

The dimensions of the oocysts were based on a study 15 to 30 oocysts picked at random.



OBSERVATION AND RESULT

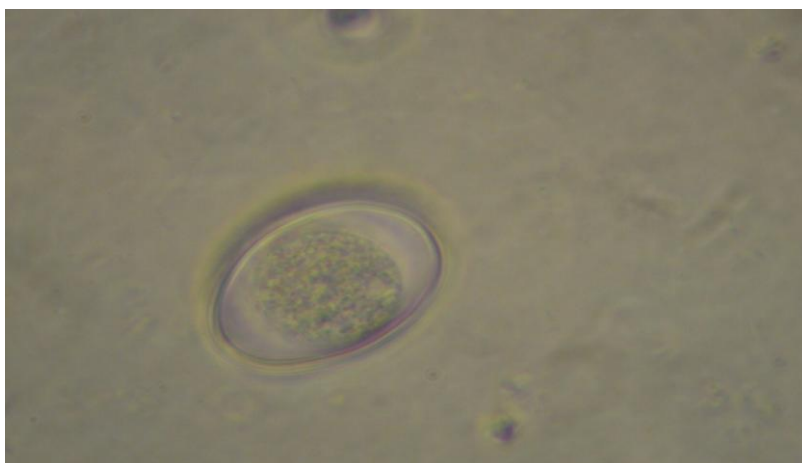
During the present study eight species of *Eimeria* are found in Broiler chicken. The commonest was *Eimeria tenella*, it was found in 270 of 908 positive samples, showing a prevalence of 29.73% of the positive samples and 10.67% of the total samples examined.

Eimeria necatrix was the second common species found in 159 out of 908 positive samples representing 17.51% of the positive samples and 06.28% of the total samples examined. *Eimeria maxima* was the third species found 134 out 908 positive samples representing 14.75% of the positive samples and 05.29% of the total samples.

Description of the oocyst of *Eimeria maxima*

The oocysts of this species is typically oval to egg shaped without micropyle and micropylar cap. The oocysts are covered with two layered wall which is 1 to 1.4 μm thick. The outer layer being thick while inner being thin, both layers are yellowish green in colour. The sporulated oocyst shows the presence of polar granule but oocystic residuum is absent.

Unsporulated oocyst contains a spherical sporoblast filling the central portion of the oocysts, measuring 9 to 13 μm in diameter. The sporulated oocysts contain four sporocysts each with two sporozoites. The sporocysts are elongated, anterior end is pointed while posterior end is broad and rounded. It measures about 6.4 to 10 μm in length and 3.6 to 8 μm in width. Sporocyst carry a stieda body. Sporocystic residuum is in the form of spherical granules. The sporozoites are elongated and a refractile globule is usually visible



Unsporulated oocyst of *Eimeria maxima*



Sporulated oocyst of *Eimeria maxima*

The dimensions of the sporulated oocysts are as follows:

(All measurements are in microns)

Particulars	Cyst from broiler chicken
Length of the oocyst	17 - 28 (22.6)
Width of the oocyst	13 - 20 (15.12)
Length width ratio	1.30 -1.4 (1.49)
Length of the sporocyst	9 - 14 (11.8)
Width of the sporocyst	5 – 8.4 (6.96)
Length width ratio of the sporocyst	1.8 – 1.66 (1.69)

Sporulation time- The sporulation time of the oocysts was 24-36 hours.

Prevalence:- The species was found 5.29 % of the 2530 broiler chicken examined from Osmanabad district (M.S.).

Table no.1**Showing the comparative dimensions of *Eimeria maxima* (based on various authors)**

Sr. No.	Authors	Length of oocyst in microns	Width of oocyst in microns	Average
1	Tyzzer(1929)	21-42	16-30	29 x 23
2	Johnson (1938)	28-38	26-36	30 x 23
3	Edger(1955)	21.4-42.5	16.5-29.8	29 x 23
4	Research report (1973) Univ .of Georgia	21.5-42.5	16.5-29.8	30.5 x 20.7
5	Jadhav (2009)	21.5-40.2	16.0-29.3	28.1 x 21.3
6	Nikam (2011)	18 - 29	14 - 23	23.44 x 18.64
7	Present author	17 - 28	13 – 20	22.6 x 15.12

COMMENTS:

This species was described by Tyzzer in 1929 and Johnson (1938). It was subsequently recorded by various workers in the different parts of the world like, Mayhew (1934), Walter H. Pattillo (1958) at Alabama, Visco (1975) in Columbia, George Conder (1980) in America, Pabolo S. Reyna et.al. (1982) Athens. J.Solis et.al.(1988), W. Malcolm Reid (1990), Donald. S. Martin et.al. (1997), McDougal et.al. (1997) from Argentina. In India this species is recorded by Chakravarthy and Kar (1946), Ray and Gill (1954), Mandal and Chakravarthy (1963), B, P. Pande and B .B. Bhatia (1968).B. B. Bhatia (1972). This species is reported for the first time by B. N. Jadhav (2009) in Marathwada region.

A comparison of the dimensions of the oocysts described here with those of earlier workers are shown in table no.1. When average size of the oocyst is compared with the size of present oocyst it is observed that the present species is smaller than all above species. Only difference between B. N. Jadhav's species and present species in present species sporocystic residuum is present which is absent in previous one. The description of the sporulated oocyst given here agrees in general with those of earlier workers. There are however minor variations in the morphometrics. So the species is considered as *Eimeria maxima* and redescribed here.

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