

New species of genus *Eimeria*(*Eimeria shivpuri*) in Broiler chicken(*Gallus Gallus Domesticus*) from Aurangabad (M.S.) India.

B.N.Jadhav¹, S.V.Nikam², S.N. Bhamare³ and E. L. Jaid⁴

¹Shri Muktanand College Gangapur TqGangapur Dist.Aurangabad (M.S.), India

²Department of Zoology, Dr.BabasahebAmbedkarMarathwadaUniverssity Aurangabad (M.S.), India

³K.R.A. College Deola Dist. Nashik (M.S.) , India

⁴Parth Sainiki Science College, Jalna Dist. Jalna (M.S.),India

Abstract

The objective of this study was first to investigate the prevalence of poultry coccidiosis and to identify the coccidial species occurring in the study area on local strain .The study involved survey, fecal examination, 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.

Keywords: Poultry, Coccidiosis, *Eimeria Sp.*

INTRODUCTION

Coccidiosis is the major problem in poultry worldwide. In our country, it causes serious problem and causing huge economic loss to poultry industry, especially in the production of Broiler chicken. Study of species composition in protozoa is addition to science. For this reason coccidia have attracted the attention of many workers [1,2,3,4,5,6 and 7].

Avian Coccidiosis, an intestinal disease caused by protozoanparasites of the genus *Eimeria*, occurs worldwide. It is considered to be one of the most economically important diseases of domesticpoultry. For many years, prophylactic use of anticoccidial feedadditives has been the primary means of controlling coccidiosis in the broiler industry and has played a major role in the growth of this industry, which now can produce about 7.6 billion chickens annually. However, development of anticoccidial resistance 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. So medical point of view their study is very important. My study covers survey and species identification of coccidia i.e. various species of genus *Eimeria* from 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 proceeded within 4-5 hours after collection. The samples were examined for the presence of 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.

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 shivpuri (n.sp.) was the third very important new species found 15 out of 734 positive samples representing 2.04% of positive samples and 00.59% of the total samples examined

Description of the oocyst *Eimeriashivpuri* (n.sp.)

The oocysts are completely rounded in shape, and covered by double layered wall. The outer wall is thick, pale yellow whereas inner wall is thin and brown in colour. Wall thickness is about 1.2um. Micropyle and micropylar cap are absent. The unsporulated oocyst shows rounded and centrally placed sporoblast. The sporulated oocysts are without polar granule and oocystic residuum. The sporocysts are elongated and slightly narrower at both the ends. Sporocyst measure about 9.2 -14.7 um in length and 5.3 -7.1um in width. Short steida bodies are present. Sporocystic residuum is present. Sporozoites are elongated and having very small retractile granules.

Received: Jan 12, 2012; Revised: Feb 16, 2012; Accepted: March 10, 2012.

*Corresponding Author

B.N.Jadhav
Shri Muktanand College Gangapur TqGangapur Dist.Aurangabad (M.S.), India

Email: bhimaarjun@rediffmail.com

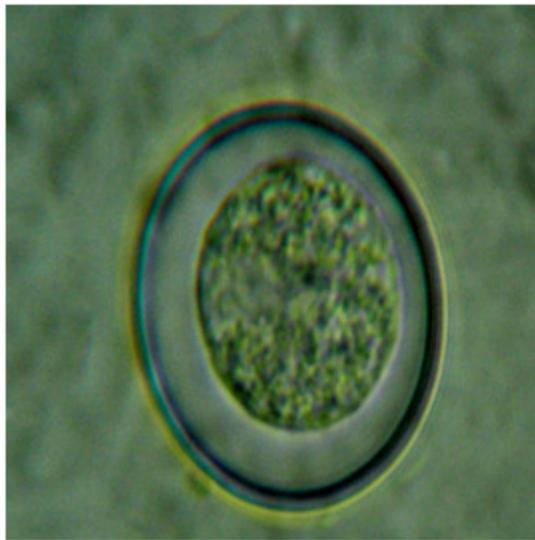


Fig 1. Showing unsporulated oocyst of *Eimeria shivpuri*

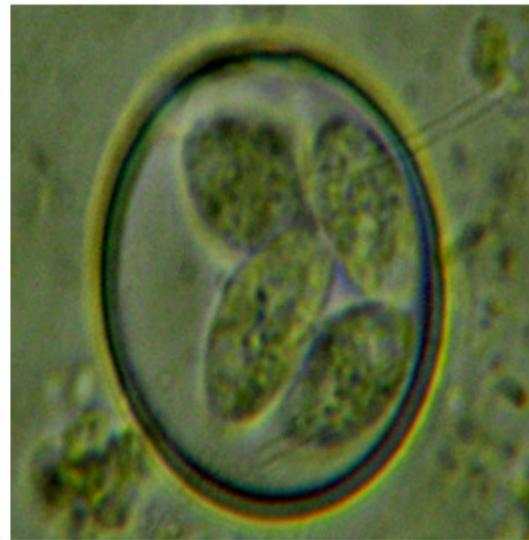


Fig 2. Showing sporulated oocyst of *Eimeria shivpuri*

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

Particulars	Cyst from broiler chicken	
Length of the oocyst	20.2-23.2	(22.4)
Width of the oocyst	20.0-23.4	(22.0)
Length width ratio	1.0 -1.0	(1.0)
Length of the sporocyst	9.2 - 14.7	(12.2)
Width of the sporocyst	5.3 - 7.1	(6.1)
Length width ratio of the sporocyst	1.6 - 1.9	(1.7)

*** 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.).

Table 1. Comparative species composition of *Eimeria* in chicken

Species/ characters	<i>Eimeria tenella</i>	<i>Eimeria necatrix</i>	<i>Eimeria brunetti</i>	<i>Eimeria acervulina</i>	<i>Eimeria praecox</i>	<i>Eimeria maxima</i>	<i>Eimeria mitis</i>	<i>Eimeria nikamae</i>	<i>Eimeria tarabae</i>	<i>Eimeria shivpuri</i>
Shape of the oocyst	Broad and ovoid	Oblong ovoid	spherical to oval	ellipsoidal	oval to spherical	Oval to Egg shaped	spherical to subspherical	oval	cylindrical	rounded
Measurement in um.	20.0-26.5x 17.0-22.0	13.2-22.5 x 10.0-18.7	20.1-29.9 x 18.0-24.3	18.3-27.54 x 13.7-20.40	19-25 x 15.1-18.7	21.5-40.2 x 16.0-29.3	14.1-19.3 x 13.1-17.5	23.5-25.5 x 18.1-19.3	22.5-27.1 x 18.1-19.3	20.2-23.2 x 20-23.4
Micropyle & micropylar cap	absent	absent	absent	Absent	Absent	absent	absent	absent	absent	absent
Polar granule	present	present	present	Present	Present	present	present	present	present	absent
Oocystic residuum	absent	absent	absent	Absent	Absent	absent	absent	absent	absent	absent
Shape of sporocyst	Broad and elongated	pyriform	elongated	elongated to ovoid	elongated	elongated	elongated oval to egg shaped	rounded	rounded	spindle shaped
Measurement	10.20-11.22x 6.1-7.0	8.16-13.2 x 5.1-6.1	8.16-13.26 x 5.1-6.2	10.20-13.26 x 5.0-6.0	10.2-13.2x 5.0-6.1	8.16-12.24 x 5.0-5.2	8.11-12.10 x 4.9-5.9	10-10 x 10-10	10-10 x 10-10	9.2-14.7 x 5.3-7.1
Stieda body	present	present	present	Present	Present	present	present	absent	absent	present
Sporocystic residuum	absent	absent	absent	Absent	Absent	absent	absent	absent	absent	absent
Shape of sporozoites	banana shaped	bean shaped	elongated	Pyriform	banana shaped	long elongated	short stumpy	short stumpy	bean shaped	elongated
Retractile body	present	present	present	Absent	Present	present	present	present	present	present
Sporulation time in hours	18-24	18-24	18-24	24-30	28-48	24-36	18-24	14-18	14-18	18-24

COMMENTS

Different Eimerian species are described from *Gallus domesticus* in India as well as in world. This is the first record of coccidia from broiler chicken in Aurangabad region of the Maharashtra state. Seven species of *Eimeria* are described from the broiler chicken in Aurangabad region. In present study seven already described species as well as two new species *Eimeria nikamae*, *Eimeria tarabaie* are study in broiler chicken, but present species is clearly marked off from all above mentioned species for shape of the oocyst as well as the sporocyst.

This species described by present author is altogether different from all the species described earlier. Oocysts of the present species are completely spherical; such shape is not seen in previously recorded species. Shape of oocyst of this species resemblances with oocysts of *Eimeria mitis* but oocyst of present species are completely rounded and in *Eimeria mitis* the oocyst are slightly elongated at anterior end.

Spherical shape of the oocyst resemblances with oocysts *Eimeria krishnamurthy* described by Bhosale [8] from *Alaudagulgula* (franklin) in Aurangabad. Though the shapes of the oocysts in both species are similar but remaining characters are altogether different from each other. Sporocystic residuum is absent in present species which is present in *Eimeria Krishnamurthy*. Sporocysts are spindle shaped with small stieda body. In present species such a shape of sporocysts is not seen in earlier described species. Polar granule is present in all the species described earlier except *Eimeria Krishnamurthy* which is absent here.

After the comparison the species with all the characters with those of earlier species, it is considered as new species. Most important differentiating character is spindle shaped sporocyst, which is never seen in previously described species, so this species is considered as new species and designated as *Eimeria shivpuri*.

ACKNOWLEDGEMENT

The authors are grateful to the Professor and Head, Department of Zoology Dr. B.A.M. University, Aurangabad (M.S.) for his kind cooperation encouragement and research facilities extended.

REFERENCES

- [1] Chakravarthy, M. and Kar, A.B.1944.Studies on the coccidia of Indian bird. IInd observations on several species of the coccidia of the sub families cyclosporinae and eimeriinae.*proc. Ind. Acta.Sci.*20 :102-104.
- [2] Tyzzer, E.E.1932. Criteria and methods in the investigation of avian coccidiosis. *Science.*75: 324-328.
- [3] Gill, B.S. and Ray, H.N. 1957. Life cycle and cytology of *Eimeria tenella* Railliet and Lucet (1891) [protozoa- sporozoa], with note on symtomatology and pathology of the infection. *Proc. Zool. Soc. Calcutta.*
- [4] Mandal, A.K. 1966. Studies on some aspects of avian coccidia [protozoa –sporozoa], *zool. Soc. Calcutta.*19:23-29.
- [5] Krishmurthy, R.and Bhosale, V.M. 1976. A preliminary report on a incidence of coccidia in bird of Mathura state .*Symp.Mod. Trends in zool. Res, Calcutta, 62* (Abstract).
- [6] Nikam, S.V. 1983. Studies on the Protozoan parasites of some mammals. Ph.D. Thesis, Marathwada University, Aurangabad (M.S.),India.
- [7] Jadhav, V.D. 2002.Studies of coccidial Fauna from Marathwada Region. Dr. B.A.M. Aurangabad (M.S.),India.
- [8] Bhosale, V.M. 1977. Studies on some coccidia of some vertebrate. Ph.D. Thesis, Marathwada University, Aurangabad (M.S.),India.