



RESEARCH ARTICLE

OBSERVATION OF EIMERIA PARVA IN GOAT AND SHEEP FROM BEED, M.S., INDIA

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ABSTRACT

During the present study ten species of *Eimeria* from sheep and twelve species of *Eimeria* from goats were found. Out of ten species in sheep eight species are redescribed and two are new species. *Eimeria crandallis* was the most frequent, being found in 108 out of 594 positive samples 18.18% of the total samples examined. followed by *Eimeria parva* 15.15%, *Eimeria weybridgensis* 13.80%, *Eimeria ninakohlyakimovae* 12.62%, *Eimeria intricata* 10.26%, *Eimeria ahsata* 9.25%, *Eimeria ovina* 6.90%, *Eimeria ajantai* 5.72%. Two new species are recorded, *Eimeria balloonii* and *Eimeria beedatus*. *Eimeria balloonii* (*n.sp.*) 4.37%, *Eimeria beedatus* (*n.sp.*) 3.70% of the positives samples examined. In case of goat out of twelve species Nine species are redescribed and three are new species. The commonest was *E. arloingi*, it was found 15.15% of the total sample examined. followed by *E. crandallis* 13.63%, *E. parva* 12.12%, *E. ninakohlyakimovae* 11.17%, *E. intricata* 10.41%, *E. christenseni*, 8.90%, *E. ahsata* 7.57%, *E. hirci* 6.62%, *E. parbhaniensis* 5.68%. Three new species are recorded, *Eimeria straightatus*, *Eimeria susheelensis* and *E. leafii*. *E. straightatus* 3.97%, *E. susheelensis* 2.84% and *Eimeria leafii* 1.32% examined. The relative prevalence of the sheep and goats are analysed.

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INTRODUCTION

Coccidiosis is an economically important disease in many species of livestock. Sheep and goats become infected after ingesting the oocysts from the environment. Understanding the life cycle of coccidia is an importance step in learning what damage they to the host, it will also help in understanding why they are so difficult to control. Coccidiosis is species –specific, it usually shows the symptoms like diarrhea with blood and mucous dehydration, fever, inappetance, weight loss, anemia, wool breaking in sheep and goats and death.

Sheep and goats are important domestic animals so it is proposed to study of species composition as well as the disease coccidiosis with symptoms. The present study was undertaken to determine the prevalence and diversity of *Eimeria* species in sheep and goats in Beed district, Marathwada region.

MATERIAL AND METHODS

The material for the study of coccidia of goats and sheep was obtained from various slaughter houses as well as from different fields in and around Beed (M.S.). Different parts of the intestine of slaughtered goats were examined and processed within 4-5 hours after collection.

The faecal contents were diluted with distilled water and sieved to remove the large faecal debris. After repeated washing the

oocysts were concentrated by centrifugation at 3000 rpm for 10 minutes. The oocysts were then spread out in shallow petri dishes and covered with 2.5% solution of potassium dichromate for sporulation.

Observation and Results

During the study ten species of *Eimeria* are found in sheep, eight species are redescribed and two are new species. *Eimeria crandallis* was the most frequent, being found in 108 out of 594 positive samples 18.18% or 4.38% of the total samples.

Eimeria parva was the second common species found in 90 out of 594 positive samples, representing 15.15% of the positive samples and 3.65% of the total samples examined.

During the present study twelve species of *Eimeria* are found in goats. Nine species are redescribed and three are new species. The commonest was *E. arloingi*, it was found in 80 of 528 positive samples, showing a prevalence of 15.15% of the positive samples or 3.03% of the total sample examined. The third species *E. parva* being found in 48 out of 368 pure samples representing 12.12 in the pure samples and 9.09 in total positive samples.

Description of the oocyst of *Eimeria parva*

The oocysts of the species collected from the goats are subspherical or ovoid in shape; micropyle and micropylar cap

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are absent. Oocyst is covered with thin dark yellow to brown coloured double layered wall, measures about 1.2µm thick. A polar granule is present but oocystic residuum is absent.

The unsporulated oocyst shows spherical granular sporoblast filling the central portion of the oocyst, about 10.0 to 16.0µm in diameter. The sporulated oocyst has four ovoid or elongate sporocysts with small stieda body. The sporocystic residuum is found at the middle of the sporocyst. The sporozoites are ovoid to pyriform and lie obliquely. Each sporozoite possesses a refractile globule. The oocysts obtained from the sheep are similar in shape but larger in size than that of oocyst of goat. Without micropyle and micropylar cap. The oocyst wall is about 1.5µm thick and comprises of two layers, smooth thin membrane and greenish with red colour. Polar granule and oocystic residuum are absent. Sporoblast of unsporulated oocyst is 12 to 18µm in diameter. The sporulated oocyst has four elongate sporocysts without stieda body.

The dimensions of the sporulated oocysts of *Eimeria parva* from goats and sheep are as follows
(All measurements are in microns)

Particulars	Oocyst from goat	Oocyst from sheep
Length of the oocyst	18.0 – 24.2 (21.9)	19.2 – 26.1 (22.31)
Width of the oocyst	14.0 – 20.0 (17.13)	16.4 – 23.2 (18.86)
Length width ratio of the oocyst	1.1 – 1.2 (1.27)	1.1 – 1.1 (1.18)
Length of the sporocyst	9.1 – 13.2 (11.14)	11.2 – 20.1 (14.28)
Width of the sporocyst	5.1 – 10.1 (9.1)	8.0 – 14.1 (10.0)
Length width ratio of the sporocyst	1.1 – 1.3 (1.22)	1.4 – 1.4 (1.42)

The frequency distribution of the lengths and widths of the oocysts of *Eimeria parva* from goats and sheep shown in fig. 5

Sporulation time

The sporulation time of the oocysts is found to be 24 hours for both hosts. In some cases, oocysts were found partially sporulated in the intestine itself.

Prevalence

The species was found in 2.42% of the 2636 goats and 3.65% of the 2462 sheep examined from Beed district.

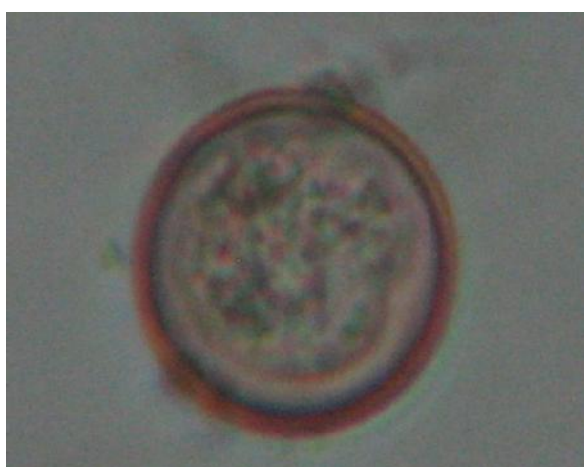


Fig.1 unsporulated oocyst of *Eimeria parva* from goat

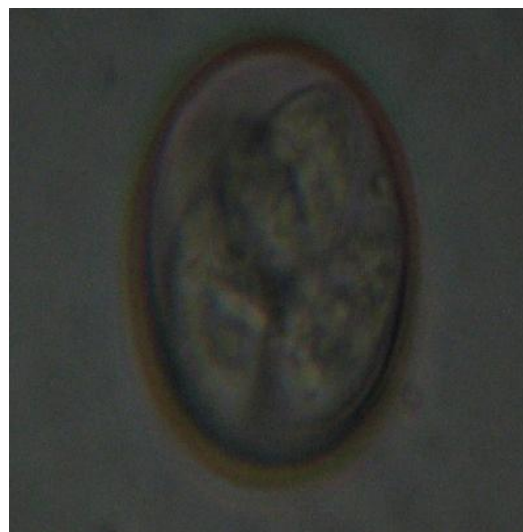


Fig.2 unsporulated oocyst of *Eimeria parva* from sheep

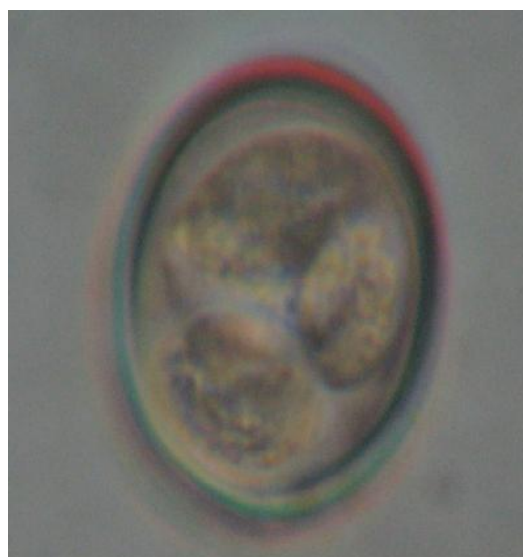


Fig.3 sporulated oocyst of *Eimeria parva* from goat

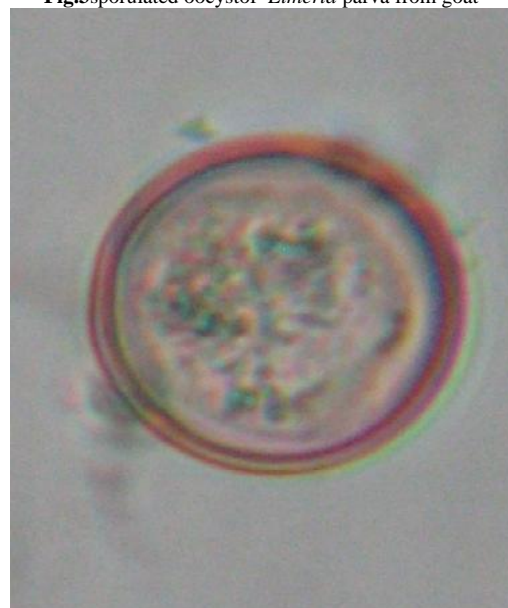


Fig.4 sporulated oocyst of *Eimeria parva* from sheep

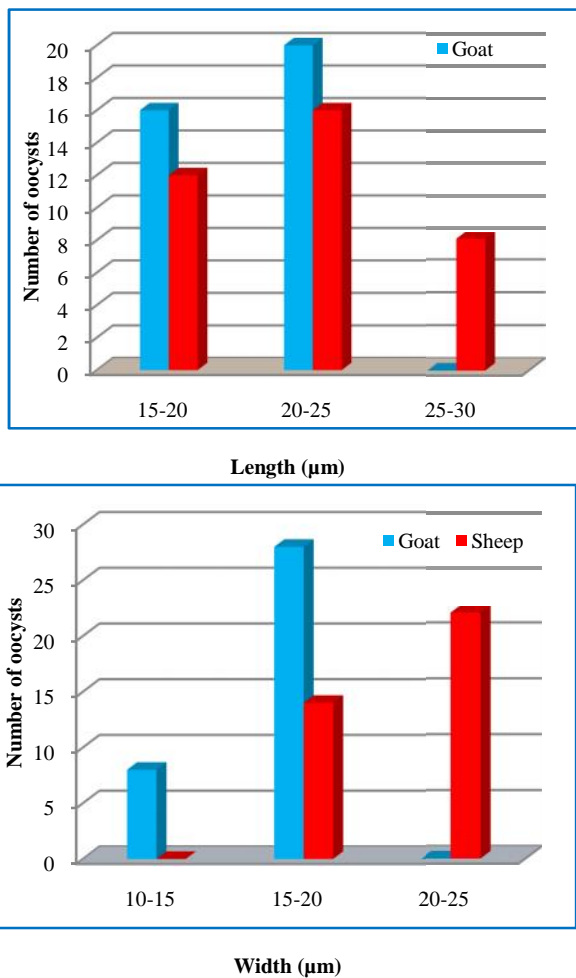


Fig.5 showing the frequency distribution of the lengths and widths of oocysts of *Eimeria parva* from goats and sheep.

Showing the comparative dimensions of oocysts of *Eimeria parva* from goats and sheep (Based on various authors) (All measurements are in microns)

Sr.no.	Authors	Length of oocyst	Width of oocyst	Average
1	In goat Shah and Joshi (1963)	16.0 – 23.0	14.0 – 22.0	20 x 19
2	Singh (1964)	13.6 – 18.7	11.9 – 15.3	16.2 x 13.4
3	Kshirsagar (1976)	17.1 – 22.8	15.2 – 19.0	18.95 x 16.45
4	Nikam (1983)	17.0 – 28.0	15.0 – 26.0	21.4 x 18.4
5	Jadhav (2002)	17.0 – 23.0	15.2 – 21.0	19.96 x 17.76
6	Present author	18.0 – 24.2	14.0 – 20.2	21.9 x 17.13
7	In sheep Bawazir (1980)	14.28 – 23.46	12.24 – 20.4	17.76 x 14.81
8	Nikam (1983)	11.0 – 20.0	9.0 – 18.0	16.4 x 13.5
9	Present author	19.2 – 26.1	16.4 – 23.2	22.31 x 18.86

Comments

This species was first described by Kotlan, Mocsy and Vajda (1929) from sheep. It has subsequently been recorded from the sheep by Balozet (1932), Christensen (1938), Svanbaev (1957), Kamlapur (1961), Shah (1963), Jackson (1964), Chevalier (1965), Bali (1972), Bawazir (1980), Nikam (1983), Varghese and Yayabu (1985), O’Callaghan *et al* (1987), Barutzki *et al.* (1990), Dasilva *et al.*(1991), Amarante and Barbosa (1992), Maingi and Munyua (1994), Arslan *et al.*(1999), Galip Kaya (2004), Gaulty *et al.*(2006), Fawzia H. Toulah (2007), Gul A (2007), Karlskirnisson (2007), Yakhchali and Golami (2008),

and Yakhchali and Zarei (2008). From goat it was recorded by Shah and Joshi (1963), Singh (1964), Chevailier (1965), Kshirsagar (1976), Nikam (1983), Kumar lalan *et al.* (2005). Rao and Hiregaudar (1964), Ray (1961), Bhatia and pande (1970), described it without reporting whether material was from goat or sheep.

Comparison of the oocysts from goats and sheep of the present author with the previous workers is given in Table - 5

After the observation of the dimensions of the various workers it has seen that the dimensions of the oocysts from goats given by present author are larger than Shah and Joshi (1963), Singh (1964), Kshirsagar (1976), Jadhav (2002), smaller than Nikam (1983). Present author observed sporocysts with small stieda body which was also recorded by Kshirsagar (1976), Nikam (1983) and Jadhav (2002) as against it was absent in the species recorded by Shah and Joshi (1963).

The oocysts of sheep of present author are larger than Bawazir (1980) and Nikam (1983). In present species sporocysts without stieda body as Bawazir (1980) also recorded sporocysts without stieda body while Nikam (1983) recorded sporocysts with small stieda body.

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