The Pharma Innovation Journal 2022; SP-11(9): 1751-1752

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(9): 1751-1752

www.thepharmajournal.com
Received: 01-07-2022
Accepted: 05-08-2022

Shashi Pradhan
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Amita Tiwari
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

DK Gupta
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

G Das
Professor and Head Department of Vety. Parasitology, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

RK Sharma
Professor and Head, Department of Vety. Pharmacology & Toxicology, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Anju Nayak
Professor and Head, Department of Microbiology, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

R Verma
Department of Veterinary Parasitology, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Shilpa Gajbhiye
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Kabita Roy
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Corresponding Author:
Shashi Pradhan
Department of Veterinary Medicine, College of Veterinary Science & A.H., N.D.V.S.U, Jabalpur, Madhya Pradesh, India

Morphometric identification of *Eimeria* species in goats at Jabalpur

Shashi Pradhan, Amita Tiwari, DK Gupta, G Das, RK Sharma, Anju Nayak, R Verma, Shilpa Gajbhiye and Kabita Roy

Abstract
Coccidiosis is one of the most important protozoan parasitic diseases of goats, particularly in the first few months of life. It is caused by intracellular protozoan parasite of the genus *Eimeria* and is distributed all over the world. The present study was conducted for a period of 15 month (Jan 2021-March 2022) and under this study morphometric identification of *Eimeria* species was done. On the basis of morphological features and sporulation time, four different species of Eimeria were identified under the study i.e. *E. arloingi*, *E. alijevi*, *E. christenseni* and *E. ninakohlyakimovae.*

Keywords: Morphometric identification, goats, faecal sample, coccidiosis

Introduction
World population and its demand for food are growing rapidly and food security of expanding human population is a serious problem to be addressed. Thus in present scenario, the livestock sector is being looked as a potential resource which can be reliably used to give impetus to sustainable production. Among all species of livestock, goats have the widest ecological range and have been poor people's most reliable livelihood resource since their domestication. Goats are essentially very hardy animals but various agents including virus, bacteria and protozoa are impeding economical production in goat industry. Among protozoa diseases, coccidiosis is one of the most important and serious economic disease of goats, particularly in the first few months of life.

Material and Method
The proposed work was conducted in the Department of Veterinary Medicine, College of Veterinary Science & Animal Husbandry, NDVSU, Jabalpur, Madhya Pradesh. The study was conducted for a period of 15 month (Jan 2021-March 2022). Prevalence study was conducted in goats of organized and unorganized goat farms *viz.* goats from livestock farm Amanala, goats brought to VCC, College of Veterinary Science and Animal Husbandry, Jabalpur and goats from unorganized sectors of Sadar, Ranjhi and Adhartal, Jabalpur. Goats were screened on the basis of clinical signs like diarrhea, dehydration, weight loss, unthriftness etc.

Collection of samples
Faecal samples
Coccidia oocyst per gram of (OPG) positive faecal samples were quantified using Mc Master slide and presence of more than faecal samples were collected directly from rectum (using examination gloves) of the suspected goats into individually marked polythene bags on day 0 (pre-treatment) and on days14, 28 and 42 (post-treatment). The samples will be stored at 4 °C for further examination.

Testing of samples
Faecal sample processing for detection of *Eimeria* species
Each faecal sample was examined for the presence or absence of coccidian oocysts by floatation technique using saturated saline. Coccidian oocysts per gram (OPG) of faeces was quantified using a modified McMaster technique. Oocysts rich positive faecal samples was diluted with distilled water and sieved to remove the large faecal debris. The washed faecal samples was centrifuged at 3000 rpm for 10 minutes with saturated salt solution and oocysts was collected from centrifuge tube.

Collected oocysts were washed with water through centrifugation followed by transfer to a shallow petridish and spiked with 2.5% solution of potassium dichromate and incubated at room temperature for 7-10 days to induce sporulation (Arunkumar and Nagarajan, 2013) [1].

Morphometric Identification of *Eimeria* spp.

To examine and identify oocysts, the samples collected, spread out in petridish will be shaken and mixed well. A portion of it was put into a glass slide through a pipette and covered by a cover slip (Verma, 2018). The sample was examined under 400X magnifications (10 X ocular and 40X objective). To identify the species, the criteria of size and morphological characteristics (shape, colour, presence or absence of micropyle and its cap, presence or absence of residual, polar and stiedae bodies) of the oocysts along with sporulation time was recorded (Pellérdy, 1974; Levine, 1985 and Soulsby, 1982) [4, 2]. Identified sample was taken up for micrometry to assist identification of various *Eimeria* species (Norton, 1986) [3].

Result and Discussion

In the present study, four different species of Eimeria were identified on the basis of morphological features and sporulation time for which exhaustive observations on longitudinal and horizontal diameters were taken and summarized. Similarly sporulation time has been also taken in to consideration for species identification (Table 1).

Table 1: Species wise micrometric and sporulation characteristics of *Eimeria* spp

Structural characteristics	Longitudinal x horizontal diameter	Average sporulation time	Species identified
No/inconspicuous Micropyle	15-21 x 10- 21	1-6 days	*E. alijevi*
Micropyle present with prominent cap	24-30x15-20	1-6 days	*E. arloingi*
Micropyle present with prominent cap	32-45x20-28	1-5 days	*E. christenseni*
Micropyle present but may be indistinct	15-25 x10-21	1-6 days	*E. ninakohlyakimovae*

In the present study, out of 300 samples examined four different species of Eimeria *viz E. alijevi, E. arloingi, E. christenseni and E. ninakohlyakimovae* were identified with the help of morphometry. A proper identification of Eimeria species is fundamental to estimate the importance of any anticoccidial treatment as different species have different role in pathogenicity.

In general, the morphometric identification revealed that the species identified in this study were similar to the species found in previous study with divergence of few species. Previous reports suggest that infection by different species and different frequencies vary according to animal or region. Co-infection with one or more species were observed in almost all positive goats. Discrete individual intraspecific variations may be due to varying environmental factors as well as host susceptibility.

References

1. Arunkumar S, Nagarajan K. Prevalence of caprine coccidiosis in Thiruvallur district of Tamil Nadu. International Journal of Food, Agriculture and Veterinary Sciences. 2013;3(1):158-160.
2. Levine ND. Veterinary Protozoology. 1st Edn., The lowa state university press, Ames, Lowa, USA; c1985. p. 150-202.
3. Norton CC. Coccidia of domestic goats, *Capra hircus*, with notes on *Eimeria ovinoidalis* and *E. bakuensis (E. ovina)* from sheep (*Ovis aries*). Parasitology, 1986;92:279-289.
4. Pellerdy LP. Coccidia and Coccidiosis, 2nd Edn. Paul Parey, Berlin; c1974. p. 720-794.
5. Soulsby EJL. Helminths, Arthropods and Protozoa of Domesticated Animals, 7th Edn., Bailliere Tindall., London; c1982. p. 809.
6. Verma R, Das G, Saiyam R, Bendigeri S. Clinical coccidiosis in calves and its treatment. Journal of Entomology and Zoology Studies. 2018;6(2):2964-2967.