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## Prevalence of haemo-protozoan parasites infection in indigenous and crossbred cattle of Kumaon Tarai region of Uttarakhand

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### Abstract

The present investigation was aimed to identify the prevalence of haemo-protozoan parasites infecting indigenous and crossbred cattle in Kumaon Tarai region of Uttarakhand. The study was carried out during 2015 to 2016 in clinically suspected cattle having pyrexia and emaciation by examining 524 blood samples. Out of these, 9.92% found positive for haemo-protozoan. Among the total positive samples, maximum 84.62% were cases of Theileriosis followed by Babesiosis in 9.62% and Anaplasmosis in 3.77%. More haemo-protozoan cases recorded during 2016 in comparison to 2015. The occurrence of haemo-protozoan diseases were higher during monsoon season followed by warm and minimum in cold season. It was 59.62%, 28.85% and 11.54% respectively.

**Keywords:** Prevalence, clinically, comparison

### 1. Introduction

Blood protozoan parasites poses a serious threat to the livestock industry worldwide. Many haemo-protozoa cause hemolysis by inducing erythrophagocytosis. Ticks are vectors of many diseases and cause direct damage by piercing the skin of the host (Khubou *et al.*, 2021)<sup>[4]</sup>. Tick and tick born diseases have a significant impact on livestock in tropical and sub tropical regions (Sharma *et al.*, 2021)<sup>[8]</sup>. Native as well as exotic cattle has always faced a daunting challenge from vector born parasites, which are economically important and resulting in huge economic loss due to *Theileria* spp. in India. *Babesia* spp. is equally important as it causes large number of animal death and production losses (Bhatnagar *et al.*, 2015)<sup>[3]</sup>. *Theileria* spp., *Babesia* spp. and *Anaplasma* spp. are endemic haemo-protozoan parasites causes severe bovine diseases in India (Vahora *et al.*, 2012)<sup>[10]</sup>. Only early detection and effective therapy can reduce the mortality rate of these haemo-protozoan diseases. The present study was aimed to identify the prevalence of Haemoprotozoan diseases in Kumaon Tarai region of Uttarakhand.

### Materials and Methods

The present investigation were carried out with 524 blood samples collected from clinically suspected native and crossbred cattle. All the sample were taken clinically suspected cattle showing various symptom of illness specially anorexia, pyrexia, emaciation and sudden drop in milk yield reported to TVCC, Pantnagar between January 2015 to December 2016. Blood samples collected and smears were prepared, fixed in methanol, stained with Giemsa stain and examined in oil immersion microscope (100X) to identify blood protozoan parasites (Soulsby, 1982)<sup>[9]</sup>.

### Result and discussion

Among 524 cattle screened for presence of haemoprotozoan parasites 52 were found positive. The study carried out over two years with the aim to detect haemo-protozoans in large animals on an annual and seasonal basis. The total prevalence of haemo-protozoan diseases detected in this investigation was 9.92%, which is consistent with the study of Bhatnagar *et al.*, (2015)<sup>[3]</sup>.

**Table 1:** Prevalence of haemo-protozoan diseases

S. No.	Haemo-protozoan diseases	Numbers	Prevalence%
1.	Anaplasmosis	3	5.77%
2.	Babesiosis	5	9.62%
3.	Theileriosis	44	84.62%
	Total	52	9.92%

Out of total positive 52 cases, maximum cases were of theileriosis (84.62%), this figure is much greater than observed by Kohli *et al.* (2014) <sup>[5]</sup> as 27.2%. The total cases of Babesiosis were recorded in 9.62% cases, this is concomitant to Alim *et al.* (2012) <sup>[1]</sup> depicted (9.25%) prevalence. Anaplasmosis was seen in 5.77% cases, this value is lesser than the reported by Ananda *et al.* (2009) <sup>[2]</sup> as 33%. These observed result may be due to breed differences, change in climate, presence of vector and age of animal (Muhanguzi *et al.*, 2010) <sup>[6]</sup>. During the year 2016, somewhat more cases of blood parasite (51.92%) were found (Table 2) as compared to year 2015. This may be due to weather conditions such as high temperature, humidity and rainfall (Nath, *et al.*, 2017) <sup>[7]</sup>. However, incidence of *Anaplasma* spp. reported (8%) during year 2015 was higher than year 2016 which is 3.7%.

**Table 2:** Year wise Prevalence of haemo-protozoan diseases in cattle

S. No.	Haemo-protozoan disease	Prevalence (year wise)	
		2015	2016
1.	Anaplasmosis	2 (8%)	1 (3.70%)
2.	Babesiosis	2 (8%)	3 (11.11%)
3.	Theileriosis	21 (84%)	23 (85.19%)
	Total	25	27

There was many seasonal variation were recorded in haemo-protozoans occurrence. During rainy season the highest prevalence was recorded i.e. 59.62% and these findings agree with the study of Ananda *et al.* (2009) <sup>[2]</sup> who reported high incidence of hemo-protozoan soon after peak of vector density due to temperature, higher humidity and rainfall, etc. The lowest haemoprotozoan prevalence was observed in winter season i.e 11.54%. Low temperature and humidity in winter are not appropriate for vector growth and reproduction responsible for lower occurrence of haemo-protozoans in the study population (Zahid *et al.*, 2005) <sup>[11]</sup>. Higher incidence of *Theileria* spp has been recorded in rainy season i.e. 29/31 (93.55%). which is similar the findings of Kohli *et al.* (2014) <sup>[5]</sup>.

**Table 3:** Seasonal wise Prevalence of haemo-protozoan diseases

Season	Haemo-protozoan disease	Total
Summer	Anaplasmosis	2
	Babesiosis	2
	Theileriosis	11
	Total	15 (28.85%)
Rainy	Anaplasmosis	0
	Babesiosis	2
	Theileriosis	29
	Total	31 (59.62%)
Winter	Anaplasmosis	1
	Babesiosis	1
	Theileriosis	4
	Total	6 (11.54%)

## Conclusion

The present study was conducted for two years to report the prevalence of blood parasites in large animals of Kumaon Tarai region of Uttarakhand and it was observed the total

prevalence was 9.92%. During study maximum disease cases were found of *Theileria* spp. (84.62%) followed by *Babesia* spp. (9.62%) and *Anaplasma* spp. (5.77%). During the year 2016, slightly more cases (51.92%) of haemo-protozoan parasite were recorded in contrast to previous year, although, occurrence of *Babesia* spp. and *Anaplasma* spp. (both 8%) during year 2015 remained same. The highest occurrence (59.62%) was recorded during rainfall due to higher density of vector population followed by warm season 28.85% and the lowest in winter season (11.54%).

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