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# Studies on Prevalence and Therapeutic Management of Anaplasmosis in Goats of Kerala

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**ABSTRACT:** A study was conducted from March 2018 to December 2018 to determine the prevalence of anaplasmosis and finding out the efficacy of oxytetracycline @ 20 mg/kg in eliminating the disease in goats of Kerala. Blood samples of 120 goats were collected and examined microscopically. The study revealed that the overall prevalence of anaplasmosis was 16.67 %. More no of animals greater than 2 years of age were affected with this disease. Positive cases were obtained during the month of October, November and December. Hematology revealed significant increase in WBC count while hemoglobin, VPRC, MCH values showed significant decrease during the period of infection. Serum biochemistry revealed significant increase in total protein and albumin levels. The main clinical signs observed in anaplasmosis positive goats were anaemia, anorexia, fever, jaundice and swollen pre-scapular lymph nodes. Positive animals were treated with oxytetracycline @ 20mg/kg intravenously for 3 days and blood smears were evaluated on fourth and fourteenth day of treatment. The treatment was highly successful and the organism was completely eliminated by fourth day and no relapse was noticed on fourteenth day.

**KEYWORDS:** Anaplasmosis, Oxytetracycline efficacy, Goats, Kerala

## I. INTRODUCTION

Goat is popularly known as 'poor man's cow'. Due to its high prolificacy, short generation interval and minimum investment for farming, it gains much importance among landless and small farmers. Caprine anaplasmosis significantly affect the profitability of milk and meat industry. This disease is mainly caused by *Anaplasma ovis*, *A. marginale*, *A. centrale*, *A. bovis* and the zoonotic agent *A. phagocytophilum*. Tick species responsible for the transmission of anaplasmosis are mainly *Rhipicephalus*, *Hemaphysalis*, *Dermacentor* and *Ixodes*. Anaplasmosis is usually asymptomatic, but it can cause clinical symptoms including fever, depression, anaemia, reduction in body weight and death in acute cases. Traditionally this disease is diagnosed microscopically, but more advanced techniques like IFAT, ELISA and PCR are also used for this purpose. Standard treatment for caprine anaplasmosis is the parental administration of Oxytetracycline. The present study was planned with the following objectives.

- To study the prevalence of caprine anaplasmosis in Kerala.
- To evaluate the efficacy of Oxytetracycline @ 20 mg/kg body weight in eliminating *Anaplasma* organisms.

## II. RELATED WORK

Anaplasmosis in small ruminants is a very serious problem in all developing countries mainly due to poor management and malnutrition. Many research work have been done on the prevalence of anaplasmosis and efficacy of Oxytetracycline in treating this disease in different parts of the world. This study will help in proper execution of control programmes against caprine anaplasmosis.

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## III. MATERIALS AND METHODS

This study was conducted to determine the prevalence of anaplasmosis and for finding the efficacy of Oxytetracycline @ 20mg/kg in treating caprine anaplasmosis in Kerala. All the animals used in the study were malabari cross breeds under semi intensive system. Animals were of different age groups ranging from 4 months to 3 years. There were 100 female and 20 male animals under this study. Animals with clinical signs of anorexia, anaemia and tick infestation were selected for the study by simple random sampling method from Kerala to determine the prevalence of caprine anaplasmosis based on blood smear examination.

### Sample Collection and Examination Procedures

Blood samples were collected from 120 goats from different places of Kerala and blood smear was prepared using this. The age, body condition and sex were recorded and blood smears were examined for the detection of *Anaplasma* species basophilic inclusions.

For the trails to determine the effectiveness of oxytetracycline, each positive animals were treated with this drug @ 20mg/kg body weight intravenously for 3 days. Treatment response was evaluated based on blood smear examination on fourth and fourteenth day of study.

## IV. RESULTS AND DISCUSSION

### Prevalence of Anaplasmosis

Out of the total 120 caprine blood smears examined, 20 samples positive for *Anaplasma* spp. basophilic inclusions. The overall prevalence rate of anaplasmosis in goats of Kerala was 16.67 %. This finding was slightly higher than previous surveys on goats (Arunkumar *et al.* 2014) done in Tamilnadu. Season, age and body condition of goats may also contribute to the difference in prevalence of anaplasmosis (Velusamy *et al.* 2016).

### Prevalence of Caprine Anaplasmosis based on Risk Factors

In the present study, anaplasmosis showed incidence more in goats of 1-2 years of age followed by less than one year age group. The least incidence was observed in goats greater than two years of age. Shabana *et al.* (2018) and Silva *et al.* (2018) reported a higher prevalence of anaplasmosis in goats less than one year of age.

More number of cases were observed in females than in males. Said *et al.* (2015) reported that female goats were more in number affected with anaplasmosis when compared to males affected with anaplasmosis.

In this study, a significant difference was observed in anaplasmosis in relation to body condition where a higher prevalence was recorded in poor body condition animal (23.75 %) compared to medium (3.33 %) and good (0%) body conditioned animals (Yoshimoto *et al.* 2010)

**Table 1: Prevalence of Caprine Anaplasmosis based on Risk Factors**

Risk factors	Number examined	Number infected (%)
<b>Sex</b>		
Male	20	1 (5%)
Female	100	19 (19%)
<b>Age</b>		
< 1 year	20	6 (3%)
1 -2 years	36	11(30.55%)
>2 years	64	3 (4.68%)
<b>Body condition</b>		
Good	10	0 (0%)
Medium	30	1(3.33%)
Poor	80	19(23.75%)

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## Clinical Signs

In this study, a high proportion of goats were presented with signs of anaemia, anorexia and presence of ticks. In anaplasmosis these clinical signs were reported by many workers (Rymaszewska and Grenda, 2008 and Yasini *et al.*, 2012).

## Hematological Studies

Mean values of RBC, hemoglobin and VPRC values of anaplasmosis affected goats were significantly lower compared to that of control group. Similar observations were made by Yasini *et al.* (2012), Khaki *et al.* (2015) and Shah *et al.* (2017). The erythrocyte indices like MCV, MCH and MCHC were lower than the control group but within normal range indicating normocytic normochromic anaemia. Significant increase was observed in leucocyte count and differential leucocyte count in the present study. Similar observations were made by Chirayath *et al.* (2012) and Nasreen *et al.* (2016).

## Serum Biochemistry

Serum biochemical estimation of anaplasmosis infected goats revealed hypoproteinemia, hyperalbuminemia, hypoglobulinemia and increase in creatinine values. Ajayi *et al.* (1987) reported that anaplasmosis could cause an increase in globulin fraction and decrease in albumin fraction levels during early and late anemic phases.

## Treatment Response

Treatment with oxytetracycline was effective in all the twenty positive animals. Remission of clinical signs and marked improvement in condition was seen in all animals. No product related adverse effects were observed during the study period. Chirayath *et al.* (2012) observed good response when oxytetracycline @ 20 mg /kg body weight intravenously for five days was administered against anaplasmosis.

## V. CONCLUSION

From the present study it is evident that anaplasmosis is prevalent in goats of Kerala affecting their productivity. This study also revealed that Oxytetracycline @20mg/kg intravenously for 3 days is very effective in treating anaplasmosis.

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