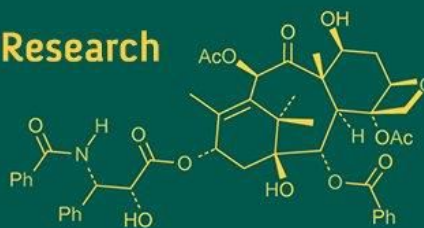


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## Caprine theileriosis and its therapeutic management: A case report

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### Abstract

This report describes and discusses a rare case of caprine theileriosis. A three-year-old Barbari buck weighing about 35 kg reared at Deep Frozen Semen laboratory, C.V.Sc & A.H. ANDUAT, Kumarganj, Ayodhya (UP) was showing symptoms of anorexia, hyperthermia (41 °C), Jowl edema, lameness in the hind limb and pale mucus membranes. The blood smear examination and haematological investigations were carried out, showing the presence of theileria organism in blood along with decreased hemoglobin (6.8 g/dl) & hematocrit (19.21%) with higher leukocyte count (20.74 ×10<sup>3</sup> cu mm). After the confirmatory diagnosis, the affected buck was treated with an intravenous injection of oxytetracycline (20 mg/Kg body weight) mixed with normal saline, followed by a single dose of buparvaquone (2.5 mg/Kg body weight) intramuscularly along with supportive therapy of Bivinal Plus injection (4 ml) and Ferritas bolus once a day for seven days. Also, to evaluate the effect of theileria infection on semen quality (such as mass motility, volume, colour and sperm concentration), a total of four ejaculates were collected from the affected buck, showing no apparent effect on semen quality except poor libido score. The recovery in diseased animal was confirmed by blood smear examination.

**Keywords:** Buck, Buparvaquone, theileriosis, semen, libido

### Introduction

Theileriosis is a tick-borne hemoprotozoan disease caused by *Theileria spp.* (Demessie and Dolan, 1989) [5]. They are obligate intracellular parasites of the phylum Apicomplexa, order Piroplasmida, family Theileriidae, and genus Theileria. Theileria species such as *Theileria lestoquardi* (Malignant theileriosis), *T. uilenbergi*, and *T. luwenshuni* are highly pathogenic for small ruminants, while *T. ovis* and *T. separata* infections typically result in benign subclinical cases; in India, *T. hirci* and *T. ovis* are the most reported species in small ruminants (Yin *et al.*, 2007; Alessandra and Santo, 2012) [12, 2]. The disease is a major threat to the livestock industry, causing economic losses due to high morbidity and mortality (Sisodia, 1981; Kaufmann, 1996) [11, 7].

### Case history and clinical observations

The affected three-year-old Barbari buck weighing about 35 kg, reared at Deep Frozen Semen Laboratory, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya (UP), exhibited a sudden onset of fever followed by anorexia, lethargy, jowl edema, and lameness in the hind limbs, along with laboured breathing. The clinical examinations revealed a high body temperature (41 °C), severe pale mucus membranes, and the animal walking with its left side head down.

Haematological analysis revealed decreased haemoglobin levels (6.8 g/dl), decreased hematocrit (19.21%), and an increased leukocyte count (20.74 × 10<sup>3</sup> cu mm). According to the protocol outlined by Sahoo *et al.* (2017) [9], peripheral blood smears were prepared from a drop of blood collected from the ear vein of an affected goat and stained with the Giemsa stain for the detection of piroplasms. Theileriosis in the buck was confirmed by microscopic detection of piroplasm (parachute, comma shaped) in the red blood cells of Giemsa-stained peripheral blood smears.

### Evaluation of semen quality

There were no effects of theileria infection on semen quality; after evaluation of seminal parameters such as volume (0.7 ml), colour (creamy white), pH (approx. 6.8), mass motility (3+) and sperm concentration (2000 million/ml), they were normal as of healthy bucks. However, during the acute phase of infection, the infected buck took a longer time to mount, showing low libido.

### Treatment and Discussion

The buck was given an intravenous injection of Oxytetracycline (Steclin, Zydus, Animal Health Care Ltd., India) at 20 mg/kg body weight mixed with normal saline, followed by an intramuscular injection of Meloxicam at 0.5 mg/kg BW and Buparvaquone at 2.5 mg/kg BW (Butalex™, MSD Animal Health, India). Bivinal Plus (B-complex liver extract with vitamin B12 injection, Alembic Pharmaceuticals Ltd., India) was given intramuscularly (4 mL) for seven days as a supportive therapy. Ferritas bolus (iron, folic acid, and vitamin B12; Intas Pharmaceuticals, India) is also used to treat anemia for two weeks.

A rough coat, high fever (41 °C), emaciation, prostration, hind limb lameness, lethargy, a normal temperature, pale pink mucous membranes, and the animal walking with its left side head down aroused suspicion of protozoal infection. Anemia, decreased hemoglobin (6.8 g/dl), decreased haematocrit (19.21%), increased leukocyte count ( $20.74 \times 10^3$  cu mm), and the presence of piroplasm (parachute, comma-shaped) in the red blood cells of Giemsa-stained peripheral blood smears confirmed the case

as theileriosis. Clinical manifestations in the present case find support from previous observations (Altay *et al.*, 2007; Banka *et al.*, 2020) [3, 4]. In addition, Shruthi *et al.* (2017) [10] reported that rod, pear, dot, nail, comma, oval, parachute, round, and semi-comma piroplasms in the red blood cells of theileria-affected goats in Karnataka, India. According to Al-Amery and Hasso (2002) [1], anemia in theileriosis is caused by the immune system removing erythrocytes infected with piroplasms, whereas leucocytosis is caused by increased proliferation of lymphocytes during the initial phase of infection.

There were no effects of theileria infection on sperm quality. After evaluating various seminal parameters such as volume, colour, pH, mass motility, and sperm concentration, they were normal compared to when the buck is in healthy condition. During the acute phase of the infection, the buck had low libido. These findings are supported by a previous study (Gibson *et al.*, 2020) [6].

Buparvaquone is the drug of choice for treating all forms of theileriosis, and a combination with Oxytetracycline is recommended for treating caprine theileriosis successfully (Kumar *et al.*, 2019; Banka *et al.*, 2020) [8, 4]. As a result, the affected goat was treated with repeated dose of Oxytetracycline (once a day) and followed by a single dose of Buparvaquone along with supportive therapy for seven days. The success of this case is due to the early detection of theileriosis in a peripheral blood smear and the initiation of treatment, which resulted in the early recovery of the affected animal. A case of theileriosis and its treatment was documented.

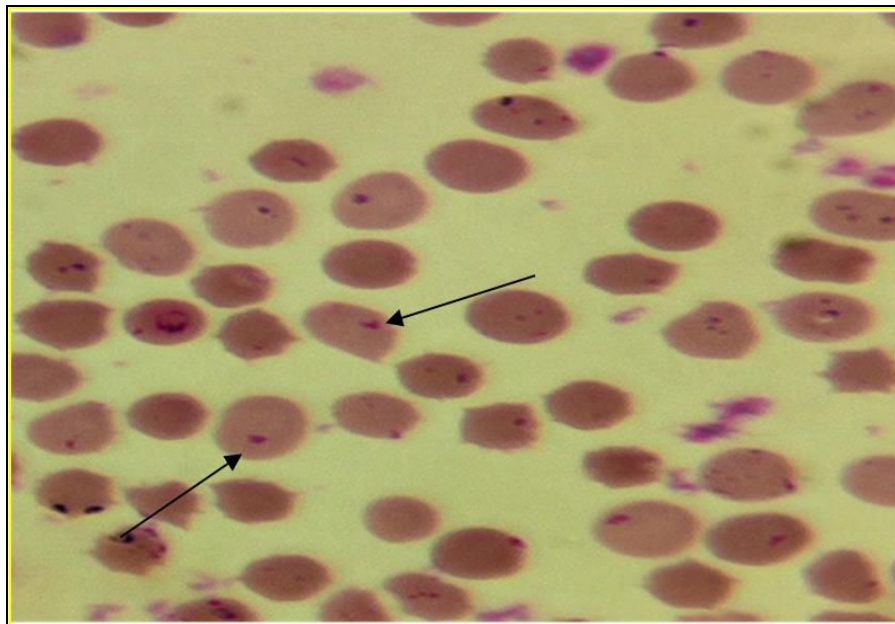


**Fig 1:** Image show the piroplasm of *Theileria*

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