

Original Research Article

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## Exophthalmia in Cross Bred Cattle Naturally Infected with *Theileria annulata*

Sabhyata Sharma, S. W. Kolte and Swapnil Magar

Department of Veterinary Parasitology, Nagpur Veterinary College,  
MAFSU, Nagpur-440006, India

\*Corresponding author

### ABSTRACT

Theileriosis is a tick borne haemoprotozoan disease caused by *Theileria spp*, *Theileria annulata* and *Theileria orientalis* most commonly. The disease has gained economic importance as it causes huge losses to farmers in the form of decrease milk production and expensive treatment of the disease. Thin blood smears and blood in EDTA from the ear vein of a Jersey cross bred female cattle aged 5 years was referred to the Department of Parasitology, Nagpur Veterinary College, Nagpur, showing symptoms of unilateral exophthalmia of left eye, severe lacrimal discharge, moderately swollen lymph nodes and increased temperature with no other clinical signs. Thin blood smear was stained with Giemsa's stain and revealed positive for piroplasms of *Theileria* in smear. The blood was also subjected to PCR using specific primers of *Theileria annulata* (Tams1) and *Theileria orientalis* (MPSP). PCR reaction has confirmed *Theileria annulata* by observing band of 750bp which encodes the 30kDa major merozoite surface antigen (Tams1). The animal was treated with Buparvoquone(5%)@ 1ml/20kg body weight. Broad spectrum antibiotics were given to control secondary bacterial infection with Vitamin B complex to boost the immunity. As expected recovery was observed with disappearance of clinical signs and exophthalmia disappeared on 7<sup>th</sup> day. Exophthalmia in crossbred calves has been reported by many scientists but this is a unique case of exophthalmia in adult cattle.

#### Keywords

*Theileria annulata*,  
Exophthalmia, Cross  
bred cattle

#### Article Info

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### Introduction

Theileriosis is a severe and often fatal haemoprotozoan disease of cattle caused by *Theileria annulata* and *Theileria orientalis*, mainly. The transmission occurs when the ticks of *Hyalomma* genus, mainly attaches to the body of hosts and vomits the sporozoites of *Theileria sp.* through saliva. In tropical countries, it is a major economical disease which hinders the improved livestock

production. The prevalence of theileriosis depends on various factors like climatic conditions, age, breed, tick density, geographical area, management factors, environmental factors that plays an important role in the spread of bovine theileriosis. Theileriosis infection in cattle is mostly characterised by clinical signs like high temperature, lymph node enlargement, reduced rumination, lacrimation, diarrhoea, development of corneal opacity, nasal

discharge and congested conjunctiva. Exophthalmia is not at all reported in adult cross bred cattle but is very common condition in calf cross bred. A new case was reported in Nagpur district with the clinical manifestation of unilateral exophthalmia with moderately swollen lymph nodes. There are no scientific reports demonstrating adult cross bred cattle with theileriosis bestowing clinical manifestation of exophthalmia to the best of the author's knowledge in published electronic data.

The present report demonstrates theileriosis in adult cattle bestowing clinical manifestation of unilateral exophthalmia. Conventional techniques for diagnosis of theileriosis were performed followed by PCR for confirmatory diagnosis, as it is reliable, sensitive technique for diagnosis and also helps to differentiate different species of *Theileria*.

### Materials and Methods

Thin blood smears and blood in EDTA from the ear vein of a Jersey cross bred female cattle aged 5 years was referred to the Department of Parasitology, Nagpur Veterinary College, Nagpur, with the clinical signs of unilateral exophthalmia of left eye (Fig. 1), severe lacrimal discharge, moderately swollen lymph nodes and increased temperature with no other symptoms. The blood smears were first poured with methanol and then stained with

Giemsa's stain, and examined for haemoprotozoan under compound microscope.

The blood sample in EDTA was subjected to PCR for confirmation of the species. DNA isolation was done using Favorgen kit, as per the manufacturers instructions. Two PCR reactions using primers of *Theileria annulata* (Tams1) and *Theileria orientalis* (MPSP) were carried out.

### Results and Discussion

#### Blood smear examination

Thin blood smear examination using Giemsa's stain revealed the presence of piroplasms in erythrocytes (Fig. 2) under compound microscope (100X).

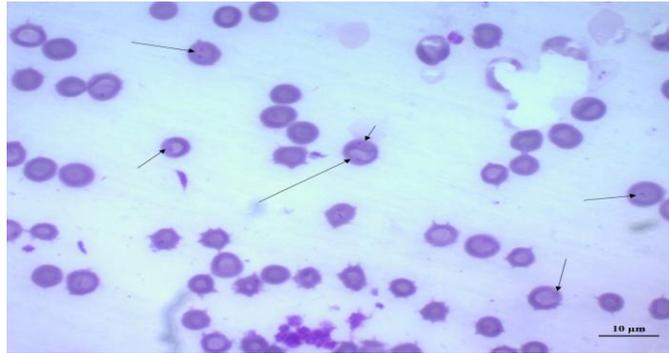
#### PCR Diagnosis

In the present study, PCR protocol was standardised for the diagnosis of *Theileria annulata* and *Theileria orientalis* in cattle. The PCR assay was conducted using species specific primers for *Theileria annulata* and *Theileria orientalis* targeting Tams1 and MPSP gene, respectively. The PCR reaction was amplified using respective primers and amplification was carried out at 750bp which encodes the 30kDa major merozoite surface antigen (Fig. 3).

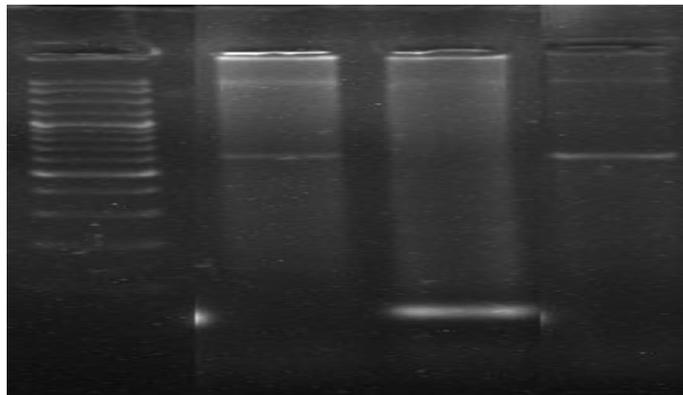
**Fig.1** Exophthalmia with severe lacrimation in cattle



**Fig.2** Piroplasms of *Theileria* in erythrocytes



**Fig.3** Agarose gel electrophoresis of amplified *Theileria annulata* DNA



**Fig.4** Recovery seen after treatment with Buparvoquone



### **Treatment**

The animal was treated with Buparvoquone (5%) @ 1ml/20kg body weight. Broad spectrum antibiotics were given to control secondary bacterial infection with Vitamin B complex to boost the immunity. Uneventful recovery was observed after 24hrs, the animal

become normal, the exophthalmia reduced after 48 hrs and complete recovery of the eye was observed on 7<sup>th</sup> day. Exophthalmia in crossbred calves has been reported (Sudan *et al.*, 2012). This is the first case in adult crossbred cattle hence the author thought to put it on record (Fig. 4).

According to the clinical signs observed, it is found that bulging of eye ball is mostly recorded in calves (Sudan et al, 2012) which is a heritable trait, mostly found at the age of 6months. The affected animal has defective vision and display difficulty in walking in unfamiliar surroundings (Smith 1990). Exophthalmia could be a consequence of slow developing ophthalmic neoplasm (lymphosarcoma) characterized by reduced ocular mobility, corneal ulcerations and exposure keratitis. It has also been reported as an outcome of retrobulbar abscesses or post orbital cysts/granuloma and sweet clover poisoning, etc. (Aiello and Mays 1998) characterized by loss of vision, intraocular bleeding and corneal oedema. As exophthalmia is reported in cross bred calves at several areas. But this is the first time, it has been reported in adult cattle. So the author thought to put it in the record.

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