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## Clinico-haematological profile and therapeutic management of anaplasmosis in a cross-bred Malabari goat: A case report

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### Abstract

Anaplasmosis is an infectious and transmissible disease manifested by progressive anemia and the appearance of other characteristic disease symptoms. It is a world-wide tick-borne disease of ruminants caused by the rickettsia *Anaplasma*. A goat aged four years was presented with a history of high fever, anorexia, reduced water intake, depression, unusual bellowing and reduced milk production. Animal was weak and emaciated with severe tick infestation under the ear. Haemogram revealed low levels of PCV, anemia and thrombocytopenia. No hemoglobinemia and hemoglobinuria was evident. Blood smear examination revealed presence of *Anaplasma spp.* within the RBCs. The animal recovered uneventfully upon treatment with long acting oxytetracycline and supportive therapy.

**Keywords:** Anaplasmosis, anemia, thrombocytopenia, oxytetracycline

### 1. Introduction

Anaplasmosis is considered as one of the ten most economically important rickettsial diseases affecting ruminants in India. It is a tick-borne disease caused by *Anaplasma* species and causes considerable economic loss to both dairy and beef industries worldwide. The disease is endemic in tropical and subtropical areas of the world. It is an infectious, non-contagious disease characterized by fever, anemia, jaundice, lethargy and anorexia<sup>[1]</sup> and substantial economic impact due to lower weight gains, productivity losses<sup>[2]</sup>, reduced fertility, abortions<sup>[3]</sup> and case fatalities<sup>[4]</sup>. The hot and humid climate is very conducive for the development and survival of potential vectors such as ticks and flies and is a constant source of infection to susceptible animals<sup>[5]</sup>. *Anaplasma spp.* are obligate intraerythrocytic parasites belonging to the order Rickettsiales and infecting ruminants. *Anaplasma marginale* is the causative agent of anaplasmosis in cattle and wild ruminants, and *A. ovis* in sheep and goats<sup>[6]</sup>. The transmission of *Anaplasma spp.* can be affected both mechanically by biting flies or blood-contaminated fomites and biologically by ticks. The distribution of anaplasmosis may continue to change due to the trend of global warming, which may influence the movement of the tick hosts<sup>[7]</sup>.

### 2. Case history and Observations

A cross-bred Malabari goat aged four years (Figure 1) was presented with the history of high fever in the last 24 hours, anorexia, reduced water intake, depression, respiratory distress, unusual bellowing and reduced milk production. Animal was found to be weak and emaciated. Upon close physical examination, dullness, enlarged prescapular lymph nodes, serous nasal discharge, severe tick infestation and papery-white mucous membrane (Figure 2) was noticed.



**Fig 1:** A cross-bred Malabari goat presented with the above-described clinical symptoms

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**Fig 2:** Paper-white mucus membrane

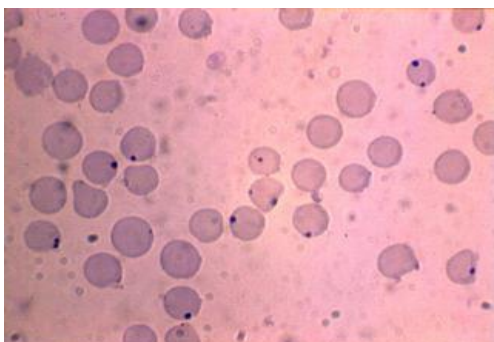
Physiological parameters like rectal temperature, heart rate and respiratory rates were found to be 104.6 °F, 90 beats per minute and 46 per minute respectively. About five millilitres of blood sample was collected by jugular venipuncture into an EDTA vacutainer for haematological examination. Peripheral blood was also collected from ear vein and a smear was stained with Giemsa to look for any blood parasites. Ticks were collected, processed and identified as per standard procedure<sup>[8]</sup>.



**Fig 3:** Tick (*Haemaphysalis spp.*) infestation

### 3. Diagnosis

Haemogram revealed low levels of total erythrocyte count (TEC) and low hemoglobin level i.e., 2.8 million cells/cmm and 4.3 g/dl respectively. Giemsa-stained blood smear examination revealed the presence of *Anaplasma spp.* within the RBCs. (Figure 4). In thin blood films, *Anaplasma spp.* appear as dense, homogenously basophilic staining blue to purple inclusions 0.3 to 1.0 µm in diameter within erythrocytes, in small clumps of two to eight organisms referred to as morula. Based on the morphological characters, the collected ticks (Figure 3) were identified as *Haemaphysalis spp.* Based on all these findings, the case was diagnosed to be caprine anaplasmosis.



**Fig 4:** Presence of *Anaplasma spp.* within RBCs of Giemsa-stained blood smear

### 4. Treatment and Discussion

The goat was treated with two doses of long acting oxytetracycline @ 20 mg/kg body weight I/M 48h apart. Other supportive therapies like Meloxicam @ 0.5 mg/kg body weight I/M for five days and B- complex injection @ 10 mL I/M once in two days was given. Significant clinical improvement was noticed after five days of treatment and the case was discharged after complete clinical recovery.

Anaplasma is an obligate intracellular rickettsial organism which infects the blood cells of mammals<sup>[9, 10]</sup>. Caprine anaplasmosis has been widely reported India<sup>[11]</sup>, but due to subclinical nature of the disease in goats, it is often considered to be of minor importance<sup>[12]</sup>. The presence of pyrexia, enlargement of lymph nodes and inappetence were identified in the similar cases reported before<sup>[4, 6]</sup>. Symptoms like grinding of teeth<sup>[4]</sup>, staggering gait and incoordination<sup>[7]</sup> were not observed in the present case history. This might be attributed to the fact, that the temperature recorded in present case was slightly lower in comparison to the findings reported in a similar case<sup>[13]</sup>. Faster recovery might be attributed to the early diagnosis and higher dose of Oxytetracycline used in the present case. Long- acting tetracycline preparations at the dose rate of 20 mg/kg given once a week for two to four weeks has been effective and Imidocarb dipropionate may be useful in caprine anaplasmosis but information on dosage and treatment schedules is limited<sup>[11]</sup>.

### 5. Conclusion

In the present case report, Anaplasmosis in a cross-bred Malabari goat and its successful management with antibiotics along with supportive therapy is documented. Small ruminants production play a major role in the rural agrarian economy of India. Goats contribute more than 52 per cent of household's total income towards nutrition and food security of the family of goat keepers. Based on several clinical case studies conducted in our country before, anaplasmosis is prevalent in goats and it is one of the major constrain for fast growing small ruminant industry. Hence, stake holders should take appropriate measures to control the tick population and also institute the chemoprophylactic measures before onset of monsoon season. This study throws light upon further research work to be conducted on caprine anaplasmosis for effective containment of the disease.

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