

**COINFECTION WITH *TRYPANOSOMA EVANSI* AND  
*ANAPLASMA MARGINALE* IN A BUFFALO AND ITS  
SUCCESSFUL TREATMENT - A CASE REPORT**

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**ABSTRACT**

*Coinfection with haemoprotozoan parasites pose a major threat to livestock health and productivity in tropical regions. Trypanosoma evansi and Anaplasma marginale are important vector-borne protozoan parasites of cattle and buffaloes. While mixed infections of Trypanosoma with Babesia and Theileria, or Anaplasma with Babesia have been documented, coinfection with T. evansi and A. marginale in livestock is rarely reported. This paper reports a case of an eight-year-old female buffalo presenting with epistaxis, bleeding from ears and hair follicles, anorexia, pyrexia, and reduced milk yield. Laboratory findings confirmed the presence of both T. evansi and A. marginale in peripheral blood smear examination, along with severe anaemia and thrombocytopenia. The animal was successfully treated with quinapyramine salts, oxytetracycline, haemostatic agents, supportive therapy, and nutritional supplementation, resulted in clinical recovery within seven days. This report highlights the clinical significance of mixed haemoprotozoan infections and the need for integrated diagnostic and therapeutic strategies in endemic regions.*

**Key words:** *Trypanosoma evansi, Anaplasma marginale, buffalo, mixed infection, epistaxis, thrombocytopenia*

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**INTRODUCTION**

Coinfections, also referred to as mixed infections, occur when two or more infectious agents coexist in the same host, often leading to complex clinical manifestations and altered immune responses (Cox, 2001). Vector-borne haemoprotozoan diseases such as trypanosomosis, babesiosis, theileriosis and anaplasmosis are of particular concern in tropical livestock

systems as they cause high morbidity, mortality and substantial economic loss due to decreased productivity, reduced fertility, threatened abortions, and death (Maharana *et al.*, 2016). Clinically, these infections are characterized by anaemia, pyrexia, jaundice, hypoproteinemia, leukopenia, thrombocytopenia, anorexia, and unthriftiness. In India, cattle and buffaloes are commonly infected with *Trypanosoma*, *Babesia*, *Theileria* and *Anaplasma* spp., either singly or as mixed infections (Mushahary, (2020), Kumar *et al.*, 2022,). *Trypanosoma evansi*, the most pathogenic Trypanosome in India, is mechanically transmitted by biting flies and causes Surra in cattle, buffaloes, horses, and camels (Pathak and Chhabra, 2011). The disease is marked by progressive anaemia, reduced condition, immune suppression, infertility, and death in chronic cases (Holland *et al.*, 2001). *Anaplasma marginale* is an obligate intracellular rickettsial organism responsible for anaplasmosis, also known as Gall sickness in ruminants. The disease is clinically characterized by haemolytic anaemia, fever, jaundice, anorexia, dullness, pale mucous membranes, muscle tremors, loss of condition and laboured respiration. Transmission occurs through tick bites or biting flies or contaminated fomites (Maharana *et al.*, 2016). While mixed infections involving *Trypanosoma* with *Babesia* or *Theileria* and *Anaplasma* with *Babesia* or *Theileria* haemo parasites are frequently reported in bovines (Magona and Mayende, 2002), concurrent infection of *T. evansi* and *A. marginale* remains uncommon. The following report describes one of such a case in a buffalo that

was presented with epistaxis and bleeding tendencies and its successful therapy.

## MATERIALS AND METHODS

### Case History

An eight-year-old female buffalo was brought to the Veterinary Hospital, Eluru, Andhra Pradesh, with a history of fever, inappetence, reduced milk yield, bleeding from the nostrils (Fig.1), ears and hair follicles (Fig.2) following minor trauma. The animal had history of calving a month earlier, and clinical signs of reduced feed intake and milk yield had been noted for five days prior to presentation. Bleeding symptoms developed two days before admission.

On detailed examination, the buffalo was found dull but responsive, with a rectal temperature of 103.8°F, tachycardia, and a body condition score of 2.5/5. The mucous membrane was markedly pallor with capillary refill time exceeding two seconds. Tick infestation was evident. The conjunctival mucosa appeared paper-white, suggestive of severe anaemia. Whole blood was collected for detailed haematological, and biochemical analysis and faecal sample for parasitological examination.

## RESULTS AND DISCUSSION

### Laboratory findings

Faecal samples examined by direct smear and sedimentation methods revealed absence of helminth/ protozoan eggs, cysts, or oocysts. Wet blood smears

examined under low magnification revealed *Trypanosoma evansi* organisms. Thin blood smear stained with Leishman's stain showed long, slender, leaf-like trypanosomes with a single flagellum attached to the body by undulating membrane, between RBC and also presence of *Anaplasma marginale* organisms within erythrocytes (Fig.3). Haematology report revealed marked reduction in RBC count, haemoglobin, packed cell volume, platelet count, indicating severe anaemia and thrombocytopenia. Biochemical parameters (creatinine, calcium, direct and total bilirubin) were within normal limits. The buffalo was treated with oxytetracycline @10 mg/kg body weight IV in 500 ml normal saline twice daily for 5 days and a single intramuscular dose of Triquin (quinapyramine sulphate + quinapyramine chloride, 2.5g). Tranexamic acid (Texableed, 10 ml slow IV for 3 days) and Botropase (10 ml IV) were administered to control bleeding. Supportive therapy included Calborol (500 ml IV after reduction in temperature), Papaya- leaf juice (50 ml orally daily), 3D-RED solution (50 ml orally for 5 days), and Ferritas bolus (one daily). Improvement in haematological values was observed by 10<sup>th</sup> day of treatment (Table.1).

Bleeding ceased by the third day of therapy, appetite improved, and full clinical recovery was observed by the seventh day. Haematological parameters returned to normal by the tenth day.

Coinfection with *T. evansi* and *A. marginale* is uncommon but clinically significant. Sharma *et al.*, (2015) reported a

co-prevalence of *T. evansi* and *A. marginale* in 10.71% of buffaloes and 5.88% of cattle using duplex PCR in Punjab. Similarly, Magona and Mayende (2002) described natural mixed infections of trypanosomosis, theileriosis, anaplasmosis and helminthosis in Ugandan cattle. These findings highlight the widespread but under-reported nature of mixed haemoprotozoan infections. Epistaxis and bleeding in this buffalo could be attributed to severe thrombocytopenia resulting from trypanosomosis and further compounded by *A. marginale* infection. *T. evansi* has been reported as a major cause of thrombocytopenia and platelet counts may also be reduced due to tick-borne coinfections (Van Wyk, *et al.*, 2014). The clinical signs observed in the present case such as fever, anorexia, epistaxis, bleeding tendencies and reduced milk production agree with earlier observations (Kumar *et al.*, 2022, WOA 2024). Similarly epistaxis due to thrombocytopenia has been observed in a buffalo infected with babesiosis (Joshi *et al.*, 2020). The haematological alterations in this case could be due to intense haemolysis by mixed infection of *T. evansi* and *A. marginale*. Reduced packed-cell volume and erythrocyte counts are characteristic of trypanosomosis, with severity influenced by the parasite species, host and course of the infection (Suliman and Feldman, 1989). Successful recovery in the present case following therapy with Triquin and oxytetracycline, along with haemostatic and supportive therapy, highlights the importance of timely and comprehensive management of coinfection with haemoprotozoan parasites.

## CONCLUSION

This case report demonstrates the clinical and diagnostic importance of mixed haemoprotozoan infections in buffaloes. Coinfection with *T. evansi* and *A. marginale* can manifest as epistaxis and bleeding disorders, secondary to thrombocytopenia. Early laboratory confirmation and the

combined use of specific trypanosomicidal and antibacterial drugs with supportive therapy will subside infection and hasten the recovery. Enhanced awareness and confirmative seroprevalence diagnosis of such coinfections of haemoprotozoan infections is required in endemic areas to keep in check the misdiagnosis, economic losses, and mortality.

**Table.1. Haematological and biochemical parameters before and after treatment of an eight year old female buffalo coinfecting with *T. evansi* and *A. marginale***

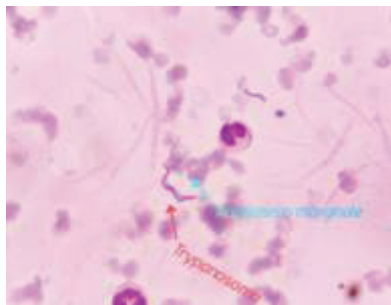
Parameter	Day 0	Day 10	Reference values
WBC ( $\times 10^9/L$ )	6.78	5.8	4.0–12.0
RBC ( $10^{12}/L$ )	2.09	6.01	5.0–10.0
HGB (g/dL)	4.2	7.1	8.0–15.0
HCT (%)	12	33	25–35
MCV (fl)	57.3	55.2	40–60
MCH (pg)	20.1	12	14–18
MCHC (g/dL)	35	21.5	30–36
PLT ( $\times 10^9/L$ )	6	150	100–800
Creatinine (mg/dL)	1.9	1.8	1.0–2.0
Calcium (mg/dL)	11.21	12.02	9.7–12.4
Total Bilirubin (mg/dL)	0.5	0.2	0–1.9
Direct Bilirubin (mg/dL)	0.3	0.1	0–0.4



**Fig.1. Epistaxis from left nostril of a female buffalo having coinfection with *T. evansi* and *A. marginale***



**Fig. 2. Bleeding from hair follicles**



**Fig.3. Inclusions of *Anaplasma marginale* organisms in RBCs and *Trypanosoma evansi* between RBCs**

## REFERENCES

- Cox, F.E. (2001). Concomitant infections, parasites and immune responses. *Parasitology*, 122, S23–S38.
- Holland, W.G., My, L.N., Dung, T.V., Thanh, N.G., Tam, P.T., and Vercruyssen, J. (2001). The influence of *T. evansi* infection on the immunoresponsiveness of experimentally infected water buffaloes. *Veterinary Parasitology*, 102(3) : 225–234. [https://doi.org/10.1016/S0304-4017\(01\)00534-9](https://doi.org/10.1016/S0304-4017(01)00534-9)
- Joshi, V., Dimri, U., Gopalakrishnan, A., Govindappa, B.A. and Alam, S. (2020). Recurrent epistaxis with thrombocytopenia secondary to babesiosis in a Murrah buffalo-A case report. *Buffalo Bulletin*, 39(4): 493–500.
- Kumar, P., Kumar, P., Rama, R.K., Rashmi, K.R., Abhay, K., Kamal, S., Paresh, S. and Manish, K. (2022). Mixed infection of tick-borne haemoparasites in water buffalo and associated pathological responses and treatment. *Indian Journal of Animal Research*. 56(8): 978-986. doi: 10.18805/IJAR.B-4450.
- Magona, J.W. and Mayende, J.S. (2002). Occurrence of concurrent trypanosomosis, theileriosis, anaplasmosis and helminthosis in Friesian, Zebu and Sahiwal cattle in Uganda. *Onderstepoort Journal of Veterinary Research*, 69(2) : 133–140.
- Maharana, B.R., Tewari, A.K., Saravanan, B.C. and Sudhakar, N.R. (2016). Important hemoprotozoan diseases of livestock: Challenges in current diagnostics and therapeutics: An update. *Vet World*, 9(5):487-95. doi: 10.14202/vetworld.2016.487-495.

- Mushahary, D., Bhattacharjee, K., Sarmah, P.C. and Deka, D.K.(2020). Prevalence of haemoparasites of cattle in four districts of Assam, India and bordering Bhutan. *International Journal of Current Microbiology and Applied Sciences* **9**(11): 1166-1176. doi: <https://doi.org/10.20546/ijcmas.2020.911.136>
- Pathak, K.M.L. and Chhabra, M.B. (2011). Trypanosomosis of livestock in India: A review of two decades. *The Indian Journal of Animal Sciences*, **81**(7).
- Riet-Correa, F., Krüger, R.F., Afonso, J.A.B. and Negrão, J.A. (2025) Trypanosomosis by trypanosoma (*Megatrypanum*) vivax in ruminants in brazil: epidemiology, clinical signs, pathology, diagnosis, and control. *Veterinary Sciences*. **12**(9):882. <https://doi.org/10.3390/vetsci12090882>
- Sharma, A., Singla, L.D., Tuli, A, our P and Bal M.S (2015). Detection and assessment of risk factors associated with natural concurrent infection of *Trypanosoma evansi* and *Anaplasma marginale* in dairy animals by duplex PCR in eastern Punjab. *Tropical Animal Health and Production*, **47**, 251–257. <https://doi.org/10.1007/s11250-014-0710-6>
- Suliman, H.B. and Feldman, B.F. (1989). Pathogenesis and aetiology of anaemia in trypanosomiasis with special reference to *T. brucei* and *T. evansi*. *Veterinary Bulletin*, **59** (2): 99-107.
- Van Wyk, I.C., Goddard, A., de C Bronsvort, B.M., Coetzer, J.A., Handel, I.G., Hanotte, O., Jennings, A., Lesosky, M., Kiara, H., Thumbi, S.M., Toye, P., Woolhouse, M.W. and Penzhorn, B.L. (2014). The impact of co-infections on the haematological profile of East African Short-horn Zebu calves. *Parasitology*, **141**(3):374-88. doi: [10.1017/S0031182013001625](https://doi.org/10.1017/S0031182013001625).
- World Organization for Animal Health (WOAH). (2024). Bovine anaplasmosis. In WOAHO Terrestrial Manual. available at [https://www.woah.org/fileadmin/Home/fr/Health\\_standards/tahm/3.04.01\\_BOVINE\\_ANAPLASMOSIS.pdf](https://www.woah.org/fileadmin/Home/fr/Health_standards/tahm/3.04.01_BOVINE_ANAPLASMOSIS.pdf)