

Molecular Detection and Treatment of Trypanosomiasis in a Cat: A Case Report

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Ind J Vet Sci and Biotech (2026): 10.48165/ijvsbt.22.1.43

Trypanosomiasis is one of the most common and important haemoprotozoan disease that affects humans and animals including cats (Mohammed *et al.*, 2022). The aetiological agent for trypanosomiasis in cats is *T. evansi* and *T. brucei* (Priyowidodo *et al.*, 2023). The disease has wide distribution in Africa, Asia, and Latin America (Da Silva *et al.*, 2010) and mainly transmitted mechanically by biting flies such as *Tabanus*, *Stomoxys* and triatomids bugs or by feeding on infected meat (Sivajothi and Sudhakara Reddy, 2017; Mohammed *et al.*, 2022). Infected cats show clinical signs such as anorexia, diarrhoea, decrease in weight, progressive anaemia, lethargy, lymphadenopathy, hyperthermia, corneal opacity, edema around the eyes and in-coordination (Da Silva *et al.*, 2011; Sivajothi and Sudhakara Reddy, 2017; Priyowidodo *et al.*, 2023). The rapid diagnosis of trypanosomiasis in animals is commonly attempted by examination of wet mount smears, and blood smears stained with Romanowsky stains such as Giemsa stain. The polymerase chain reaction (PCR) technique can be performed for further confirmatory diagnosis (Mohammed *et al.*, 2022; Priyowidodo *et al.*, 2023). However, there was a paucity of literature available on natural infection of feline trypanosomiasis in the world (Sivajothi and Sudhakara Reddy, 2017), Hence, the present case study on trypanosomiasis in cat and its successful treatment in Bidar district, Karnataka, India is reported.

CASE HISTORY AND OBSERVATIONS

A one and a half year old female domestic short hair cat was presented to referral hospital at Department of Veterinary Clinical Complex, Veterinary College, Bidar (KVAFSU, India) by its owner with a complaint of anorexia, loss of vision, bilateral opacity of eyes, lacrimation, weight loss and recent history of still birth of six kittens. The physical examination of the animal revealed increased rectal temperature (104.2°F), bilateral opacity of cornea and corneal vascularization, hyphema and protrusion of third eyelid in both the eyes (Fig. 1). The palpebral reflex, cotton ball reflex, menace reflex and pupillary light reflex were completely absent.

A wet mount examination of blood revealed circular or rotary motion of *Trypanosoma* spp. and a Giemsa-stained thick peripheral blood smear examination indicated presence

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How to cite this article: Jafar, S., Mamatha, G. S., Kumar, N., Bijurkar, R. G., & Rathnamma, D. (2026). Molecular Detection and Treatment of Trypanosomiasis in a Cat: A Case Report. *Ind J Vet Sci and Biotech*, 22(1), 207-209.

Source of support: Nil

Conflict of interest: None

Submitted 24/09/2025 **Accepted** 09/10/2025 **Published** 10/01/2026

of *Trypanosoma* spp. organisms confirming the disease (Fig. 2). The haematological studies revealed severe anaemia with decreased haemogram 6.9 g%; RBC $4.1 \times 10^6/\mu\text{L}$ and PCV 29%, but total leucocyte count ($12,320/\mu\text{L}$) was within normal range. The biochemical analysis revealed SGPT values of 20.17 IU/L, SGOT of 29.40 IU/L, ALP of 77.33 IU/L, total bilirubin was 1.09 mg/dL with conjugated and unconjugated bilirubin levels of 0.43 mg/dL and 0.66 mg/dL respectively, total proteins of 7.14 g/dL, albumin levels of 5.07 g/dL, globulin levels of 2.1 g/dL with A:G ratio of 2.4, serum glucose was 49 mg/dL and creatinine levels of 1.80 mg/dL was recorded.

Approximately 1 mL of blood was collected in a EDTA vacutainer for further molecular diagnosis. The genomic DNA was extracted by using commercial kit as per manufacturer's procedure and stored at -20°C. The conventional PCR was carried out at Diagnostic Parasitology, Southern Regional Disease Diagnostic Laboratory (SRDDL-GOI), IAH&VB, KVAFSU, Bengaluru, in 25 mL PCR reaction mixture using species specific DITRY primers (Forward primer 5' CGACCAGCCAGAACGAGCAGAAT 3'; Reverse primer 5' CTTGTCGATCGAGTTGACGGT 3') by targeting *vsg* gene to amplify 400 bp DNA fragment specific for *T. evansi* (Sengupta *et al.*, 2010). The cycling conditions included initial denaturation at 94°C for 3 min, followed by 35 cycles of 1 min denaturation at 94°C, 1 min annealing at 54°C and 1 min extension at 72°C. The primer extension was carried out at 72°C for 10 min. The positive DNA obtained from ICAR-NIVEDI; Bengaluru was used as a positive control. This confirmed the

organisms as *T. evansi* by yielding specific amplification at 400 bp size DNA fragment (Fig. 3).



Fig. 1: Corneal opacity

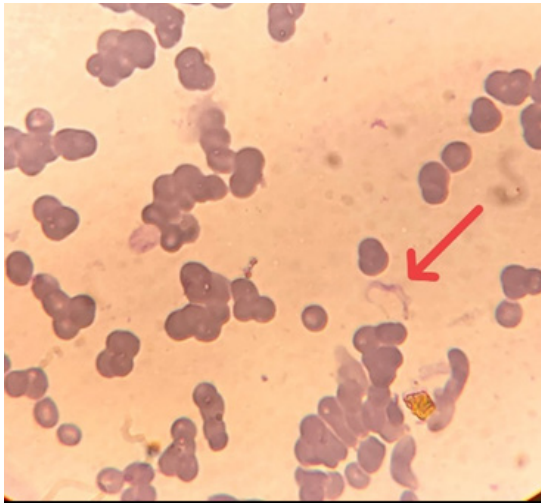


Fig. 2: Trypomastigote stage in blood smear

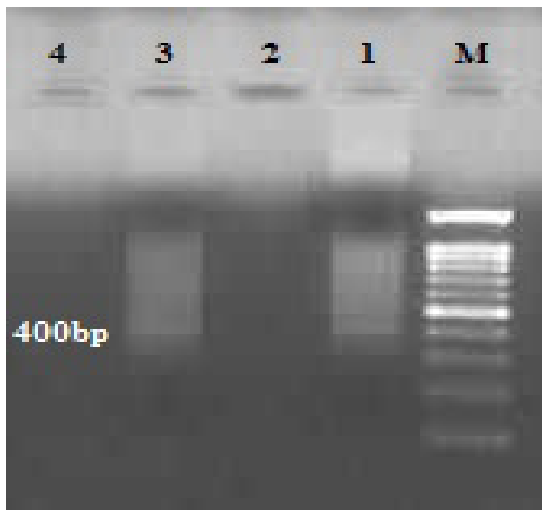


Fig. 3: The agarose gel showing amplification of 400 bp specific for *T. evansi*. Lane M: 100 bp ladder, Lane 1: Positive control, Lane 2: Negative control, Lane 3: Cat blood sample, Lane 4: NTC (No template control)

TREATMENT AND DISCUSSION

The cat was treated with injection Nyzom[®] @ 1 mg/kg, injection Melonex[®] @ 0.2 mg/kg body weight, and injection Tribivet[®] 0.5mL total dose administered intramuscularly. The patient was supplemented with syrup aRBCe[®] @ 2.5 mL given p/o, and eye drops Hypersol[®] administered three times daily to treat opacity. The examination of peripheral blood smear after 3 days of treatment revealed negative for trypanosomes and corneal opacity resolved after two weeks of treatment (Fig. 4).

The affected cat showed clinical signs like fever, blindness and opacity of the cornea, which is in agreement with Da Silva *et al.* (2011), Sivajothi and Sudhakara Reddy (2017) and Tresamol and Vincy (2023). The affected cat had the history of feeding raw beef meat which could be the probably route of transmission of trypanosomes. The similar findings were reported by Sivajothi and Sudhakara Reddy (2017). There was a decrease in red blood cell count, haemoglobin concentration and packed cell volume indicating anaemia similar to findings reported by Da Silva *et al.* (2011) and Mohammed *et al.* (2022). During this study, elevated levels of serum creatinine was observed which is in contrary to Da Silva *et al.* (2010), who recorded normal levels of serum creatinine in affected cats. Sivajothi and Sudhakara Reddy (2017) treated a cat with trypanosomiasis using diminazene aceturate (3.5 mg/kg b.wt, deep i/m), inj. Ringer lactate, 5% Dextrose normal saline (5 mL/kg b.wt, i/v) and inj. Ranitidine (2.0 mg/kg b.wt, i/m) for four days. However in the present study, Isometamedium @ 1 mg/kg b.wt, i/m was administered and the affected cat showed clinical recovery in one single dose.

In brief, the feline trypanosomiasis can be treated with single administration of injection Isometamedium (Nyzom) along with supportive therapy.

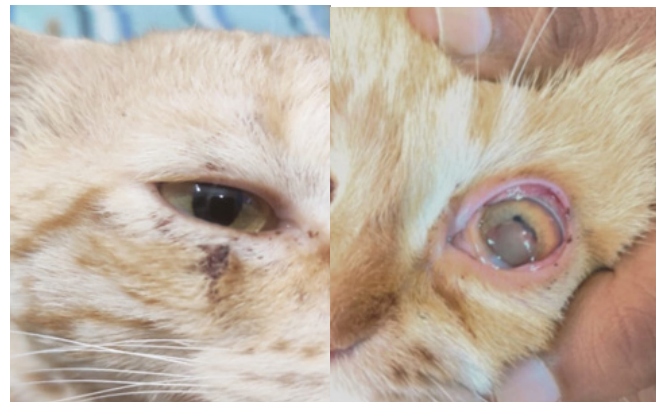


Fig. 4: Improvement in clinical condition

ACKNOWLEDGEMENT

Authors are thankful to the Dean Veterinary College, Bidar for providing facilities.

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