INTRODUCTION

India has a rich heritage of wildlife as well as a long history and tradition of conservation. The conservation ethic was imbibed in the sylvan surroundings of the ashrams of sages which were the seats of learning in the country’s ancient past. India is unique in the richness and variety of its wildlife. There are about 350 species of mammals, 1200 species of birds and more than 20,000 species of insects.

It is confronted with the sad paradox of wildlife in India fast disappearing. 66 species of mammals, 38 species of birds and 18 species of amphibians and reptiles including all the three species of crocodiles found in India are now listed in Schedule I of the Wildlife Protection Act, 1972 as rare and threatened. India’s hunting cheetah, which was the fastest land animal on earth has become extinct. The Royal Bengal Tiger, the population of which was believed to be nearly 40,000 by some estimates at the turn of the century, was found to have been reduced to only 1,827 animals during a national census in 1972.

To an average citizen in India, it is difficult to understand why wildlife conservation should be important. Conservation of wildlife is an essential component of environmental rejuvenation. India with a diversified climate has provided a magnificent spectrum of nature spread over 329 million hectares of geographical area. Since the wildlife is the mirror of the health of the environment, its protection is of paramount importance. Today the grim situation in India is elucidated by the fact that only about 359 Asiatic lions (Panthera leo), 1,411 tigers (P.tigris), 27,694 (2007-08) elephants (Elephas maximus) are reported according to the 2008 census. Denudation of natural habitats and large scale deforestation apart from poaching in the South Asian sub-continent has been mainly responsible for this grim situation.

The state of Karnataka with a total geographical area of 1, 91,773 sq.kms contains tropical evergreen, moist deciduous and dry deciduous type of forests of the extent of 38,808 sq.kms. Three national parks, 13 sanctuaries and 2 closed areas constituted so far, cover an area of 9,905 sq.kms, which is 5% of the total geographical area and 26.5% of the total forest area. During the 2005 census the elephant range was around 5000. Tiger census in Karnataka of 2001-02 indicated the number of tigers within the range of 350 to 400. A rescue centre was established at Bannerghatta National Park which housed 96 lions and 4 tigers, rescued from various circuses.
The National Wildlife Action Plan provided the framework of the strategy as well as the programme for conservation of wildlife. The first National wildlife Action Plan of 1983 has been revised and the new Wildlife Action Plan (2002-2016) was adopted. The Indian Board of Wildlife, headed by the Prime Minister, is the apex advisory body overseeing and guiding the implementation of various schemes for wildlife conservation. The wildlife Protection Act, 1972 was amended in 2006 to incorporate the creation of the National Tiger Conservation Authority.

The present study was undertaken on *Trypanosoma evansi* infection which is known to be widespread in various wild animal species including tigers, lions, leopards, jungle cat, jaguar, wolf and in herbivores such as deer, elephant etc.. Many of the affected animals succumb or recover after appropriate therapy. Number of deaths due to trypanosomosis is alarming among tigers especially the deaths of many tigers at the Nandankanan Biological Park, Bhubaneshwar (Samantray et al., 2003), which was a very serious issue at that time. The vectors such as *Tabanus tropicus*, *T. optatus*, *T. partitus*, *T. rubidus*, *T. striatus*, *T. triceps* (*Tabanidae*), *Chrysops dispar*, *Atylotus agrestis*, *A.cryptotaxis*, *Stomoxys calcitrans*, *S.dubitalis*, *Haematobia irritans exigua* and *Musca crassirostris* play an important role in the disease transmission. The hot and humid climate is most ideal for breeding of these flies and as such the incidence is coincided with floods and inundations in tropical countries. After a blood meal is taken from the trypanosome infected animal, the susceptible animals get readily infected through bite of infected flies (Vijay Veer et al., 2002).

Surra may cause serious disease in elephants and working elephants in the forest area more susceptible to *T.evansi* (Chandrasekharan, 1995). This disease has been observed to occur during the rainy season. It is characterized by a rise in body temperature at the onset of the disease, anorexia, dullness, restlessness and sleepy mood, reluctance to work, edema on the trunk, neck, brisket, lower abdomen and limbs, dry and harsh skin and sluggish movements. Several elephants become anemic, dehydrated and may die due to progressive anemia and extreme weakness. Camelian trypanosomosis has been characterized with high fever, marked depression, dullness, impaired appetite, loss of condition, emaciation of hind quarters, anemia and in some cases corneal opacity. In Rajasthan, where most of the population of camels exists, surra is endemic in the western parts of the state affecting at least 18 districts. The camels are susceptible regardless of breed, sex or age.
The wild carnivores may get infection by ingestion of infected meat, particularly when there is abrasion in oral mucosa. The recovered animals act as carriers and remain as a source of infection to other susceptible animals for several months.

Accurate diagnosis of surra is extremely important both in identifying the animals for treatment as well as to know the prevalence of disease. Demonstration of parasites, parasite antigen, antibodies and trypanosome DNA is necessary to reach a definitive diagnosis. Though clinical signs are indicative of surra, diagnosis needs to be confirmed by laboratory methods.

The standard diagnostic methods for the diagnosis of trypanosomosis are based on demonstration of parasites by variety of techniques which include direct microscopy, animal inoculation and concentration methods. Parasitological diagnosis based on demonstration of organisms in blood by direct microscopy often considered as a ‘gold standard’ but has inherent limitations due to cyclic fluctuating nature of parasitaemia in subclinical and carrier animals. The diagnosis of trypanosomosis is a very difficult task as the infected animals often may not manifest any specific clinical symptoms. The diagnostic capability of the test would be effectively improved by adopting low cost alternative haematocrit centrifugation technique, buffy coat technique or the quantitative buffy coat method.

Although direct demonstration of the trypanosomes in the infected animal give conclusive evidence of the infection, detecting the carrier status of the infection poses a great challenge for the knowledge of the epidemiological surveillance. So, detection of *T.evansi* antibodies during the infection in wild animals can be done by few of immunological test such as Latex agglutination test, Passive Agglutination Test etc.

The DNA based detection procedure eliminates cross reactions and increases the specificity and sensitivity. A wide range of DNA based techniques are currently in use for trypanosome detection including polymerase chain reaction, random amplified polymorphic DNA analysis, kinetoplast DNA analysis, minicircle DNA analysis, minisatellite DNA analysis and DNA hybridization using repetitive DNA sequences. PCR and nucleic acid hybridization both offer specificity and sensitivity as applicable to large scale analysis of trypanosome samples (Hide and Tait, 1991). A simple and rapid method for detection of *T.evansi* in dromedary camel using nested PCR was recently described (Tewari, 2004; Aradaib and Majid, 2006).
In wild animals, diagnosis of trypanosomosis is reported during the acute phase, when animals show symptoms of high fever, reduced appetite, debilitated condition and blood examination, reveals parasites or it is detected on necropsy when the animals die suddenly.

In India, detailed studies have not been conducted on *Trypanosoma evansi* infection in captive wild animals. Therefore, the present study was undertaken in three major zoos of Karnataka located at different geographical regions viz., Bannerghatta Biological Park, Bangalore: Shri Jayachamrajendra Zoological Gardens, Mysore and Tiger-Lion safari at Thyavarekoppa, Shimoga with following objectives.

1. Serodiagnosis of wild felines and herbivores in captivity for trypanosomosis by Passive haemagglutination test.

2. Development of PCR based diagnosis for detection of trypanosomosis in captive wild animals.