

Wildlife diseases management: a case study from Periyar Tiger Reserve, Kerala, India

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Wildlife diseases management and wildlife health monitoring in protected areas is a prelude to the management of mega fauna in the protected areas. A case study from Periyar Tiger Reserve (PTR), Kerala, India in free ranges animals' reveals that two important diseases like amphistomiasis in Sambar and anthrax in Elephant. They were controlled by effective management interventions by extensive survey to detect the diseased animals. The diagnosis was based on field observations and treatment was done not only for the affected animals but also localizing and treating the source of the pathogens. An elaborate health monitoring protocol was developed in PTR for management of wildlife diseases. The present study gives a base line data in the wildlife health monitoring in South India.

Keywords: Periyar Tiger Reserve, anthrax, amphistomiasis, sambar, wildlife diseases

The mass mortalities in wild fauna and emerging diseases of wildlife in any protected areas make the ecosystem unbalanced. Sometimes it happens naturally but other times it may be due to anthropogenic activities as well. Both are responsible for creating epidemic like situation for particular taxa in free ranging situation. Mass mortality of any particular wild animals breaks the food chain systems and creates an adverse situation for the protection and conservation (Gortazar et al., 2014). The Western Ghats (WGs) are rich with wild taxa as well as affected with anthropogenic activities (Marchese 2015). The activities sometimes translate into mass mortality in the WGs. Periyar Tiger Reserve (PTR) is also not untouched. Keeping this in view an attempt has been made to study the Wildlife diseases occurring in free ranging animals of PTR. Study area is rich with faunal diversity (Radhakrishnan and Kurup, 2010; Mahanti et al., 2016) having high risk of spreading microbial diseases. The previous reports revealed that in the year of 1970, it was found that Rinderpest in wild gaur caused mass mortality in South India (Sinha, 2012). The common diseases among the faunal diversity are anthrax, foot & mouth diseases,

hemorrhagic septicemia, endotheliotropic elephant herpes virus, chytrid and amphistomiasis etc (Mondal and Yamage, 2014). To create awareness on biosecurity and wildlife health, two important diseases, anthrax in elephant & amphistomiasis in female sambar deer were selected as a case study in the study areas. The objectives of the study were to understand the mass mortality of these two key animals of the study areas for maintenance of the ecological balance with special emphasis on tiger conservation. An extensive survey was carried out to screen the diseased animals. A team of forest staffs including an AFVO (Assistant Forest Veterinary Officer) were deployed to collect the sample using standard methods (Wobeser 1996). The Collected samples were sent to analyze in concerned authorized laboratories and AFVO reported that the infections might be responsible due to *Paramphistomum*, *Physa*, some other snails and gram-negative *Coccobacillus*. An increase in the death of Sambars in Thekkady Range of study area was recorded since August–September 2006. The primary diagnosis revealed that the causes of deaths were varied including Tiger kills & the samples from Heart, Liver, Kidney,

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Figure 1 Female Sambar deer with unborn calf affected with amphistomiasis

Spleen, Lungs, Intestine, Uterus, Brain and Blood smears were sent to CDIO, Palode, District Veterinary Centres at Thiruvananthapuram and Kollam, India. The results confirmed that the samples were free of anthrax causing microbes and the advanced experiments confirmed the samples having the pathogens of amphistomiasis. The analysis of the rational of this lethal disease is the contaminated water of Kumily town which comes into the water bodies of the study area in the Edapalayam and Sakunthalakadu area of Thekkady Range where the deaths of sambar deer mostly occurred. Amphistomiasis

is a parasitic disease caused by helminthic flatworms mainly found in the cattle. When the slaughters cut the cattle, the blood and other infected parts of parasites responsible to Amphistomiasis come into the drain and from where it reaches the water bodies of the study areas. Near the water bodies, parasite come by the intermediate host and when a healthy Sambar deers take the water & herbaceous materials along with intermediate host and get infected with amphistomiasis (Figure 2) can be leading to haemorrhagicsepticemia.

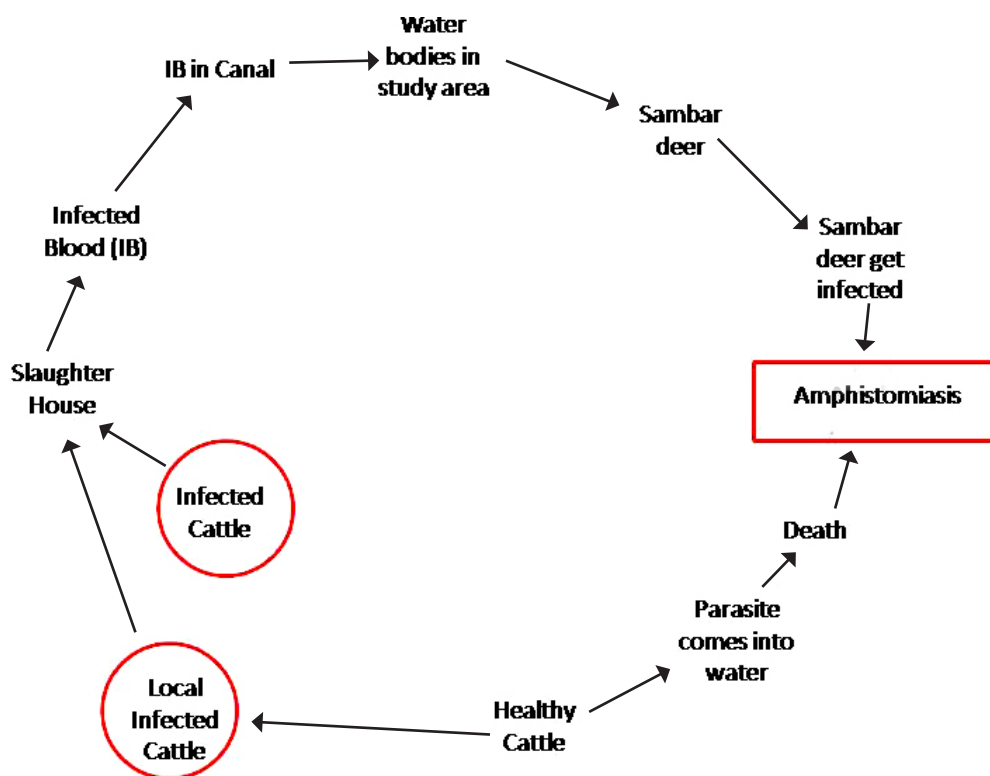


Figure 2 Cycle of Sambar deer death by amphistomiasis

In the year 2006–2007, it was noticed that about 9 sambar deer died due to this disease and a few of them were female with unborn calf (Figure 1). It indicates the harmful impact of anthropogenic activities on the most preferred prey of tiger in the study areas. The actions to combat this disease were taken by the local authorities to improve the immunity and to check the transfer of pathogens in healthy cattle and 17,000 cattle were vaccinated in Kerala and Bodring district of Tamil Nadu, India. In the study area, the other wildlife hazards that took place in wild elephant were anthrax and it was observed first time in the year 2007. Anthrax is caused by rod-shaped gram-positive bacteria *Bacillus anthracis*, surrounded by a well-developed capsule. The capsule is important for diagnosis of the organism in blood smears. The bacteria sporulate to form spores when they come in contact with the environment. Spores are very hardy and can survive for years in old bones and in the soil. In India, the literature about existence of anthrax in domestic and wild animals (Arya and Bhatia, 1992; Rawat et al., 1990; Sharma et al., 1992; Sharma et al., 1996) is available but symptomatology is not well described in Indian literature on anthrax in elephants. It may occur in skin and intestine. In the year 2007, it was noticed that a bloated elephant was found in the Vallakadavu range of the study area. Samples were collected as blood from the ear tip and confirmed positive of anthrax in the lab of CDIO, Pallode, Kerala. After the event, in present study the preliminary actions were taken to stop the diseases from spreading to healthy wildlife was burning the carcass, burning the surrounding area and to disinfect with bleaching powder and formaldehyde. The area was banned for the human activities. The above hazards created a need for a sound wildlife health monitoring protocol in the study area. The beginning of this was made first time in 2007 for the study area. The main objective of the protocol was to report the sighting of sick and dead animal immediately, monitoring mortality documentation, postmortem, deworming and vaccination schedule was drawn and followed meticulously. Every protected area in India is the house of mega fauna and they are facing diverse health problems. Therefore, there is a need to develop a wildlife health monitoring protocol based on the field conditions. Present study highlights the importance of field survey to detect the unhealthy animals. The present work gives firsthand information on the source of pathogens and how they can be controlled. Therefore, it is concluded that vaccination and deworming is needed where the wildlife habitat is traversed by the domestic animals and much anthropogenic activities.

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