

Short Communication

OCCURRENCE AND ELIMINATION OF *MYCOBACTERIUM TUBERCULOSIS* SUBSTANCES IN SPOTTED DEER (*AXIS AXIS*) AT JUNGLE MAHAL ZOOLOGICAL PARK, JHARGRAM, INDIA

Chanchal Datta^{1*}, Sulata Mondal², Sheik Fareed J³

Received 03 May 2024, revised 19 June 2024

ABSTRACT: An increased rate of death of Spotted deer (*Axis axis*) at Jungle Mahal Zoological Park, Jhargram, West Bengal, India was observed. Many other spotted deer of the herd were observed losing of body weight. Their body weight was reduced gradually despite the provision of optimum nutrients. During post-mortem examination of the dead spotted deer, typical tuberculosis findings were observed. Samples were sent to the laboratories, and were found to be *Mycobacterium tuberculosis* (MTB) positive. Treatment of MTB was started accordingly. After the treatment phase, multiple samples were sent again to the laboratories and all the samples were negative as per the laboratory reports. It is the first positive report of MTB in Spotted deer in West Bengal, India.

Keywords: *Axis axis*, *Mycobacterium tuberculosis*, First report of MTB.

Tuberculosis is a chronic, contagious disease of man and animals caused by certain pathogenic organisms of the genus *Mycobacterium*, characterized by the development of tubercles with resultant caseation and calcification. It is a zoonotic disease [1, 2]. This is one of the ancient diseases and is worldwide in distribution. The disease is highly prevalent in tropical and sub-tropical countries. The organisms are slender, slightly bent, or straight acid-fast rods. The organism is stained by Ziehl-Neelson's method and examined microscopically under an oil immersion technique [1, 3].

Organisms are excreted in exhaled air, sputum, feces, milk, urine, vaginal and uterine discharges, and discharges from open peripheral lymph nodes from infected animals or human beings. The most common portals of entry of infection are inhalation and ingestion. The risk increases when large numbers of animals are in close confinement [1, 2].

Study of the cases

In the period 2018 and onwards, it was observed that the mortality of spotted deer at Jungle Mahal Zoological Park Jhargram, West Bengal, India had increased rapidly. Simultaneously it was observed that the body weight and skin coat of the rest animals in the herd slowly but continuously deteriorate despite the provision of optimum nutrients. During Post mortem examination of dead animals, the main observations were adhesion of the pleura with the lungs, presence of nodules on the inner side of the chest wall and the inner surface of the rib, and several white and yellow colored nodules of various sizes were present throughout the surface of the lungs as well as also in liver, spleen, etc. These nodules were calcified and contained caseous necrotic materials. Lungs were pneumonic showing the changes of consolidation. Enlarged spleen and ascites were also noticed in maximum cases (Fig. 1). The tissue samples were sent

¹Assistant Director, ARD, Govt. of West Bengal, India.

²Ex-Veterinary Officer, SAHC, Jhargram. ARD, Govt. of West Bengal, India.

³Ex-DFO, Jhargram division. Department of Forest, Govt. of West Bengal, India.

*Corresponding author. e - mail: drgdvet@gmail.com

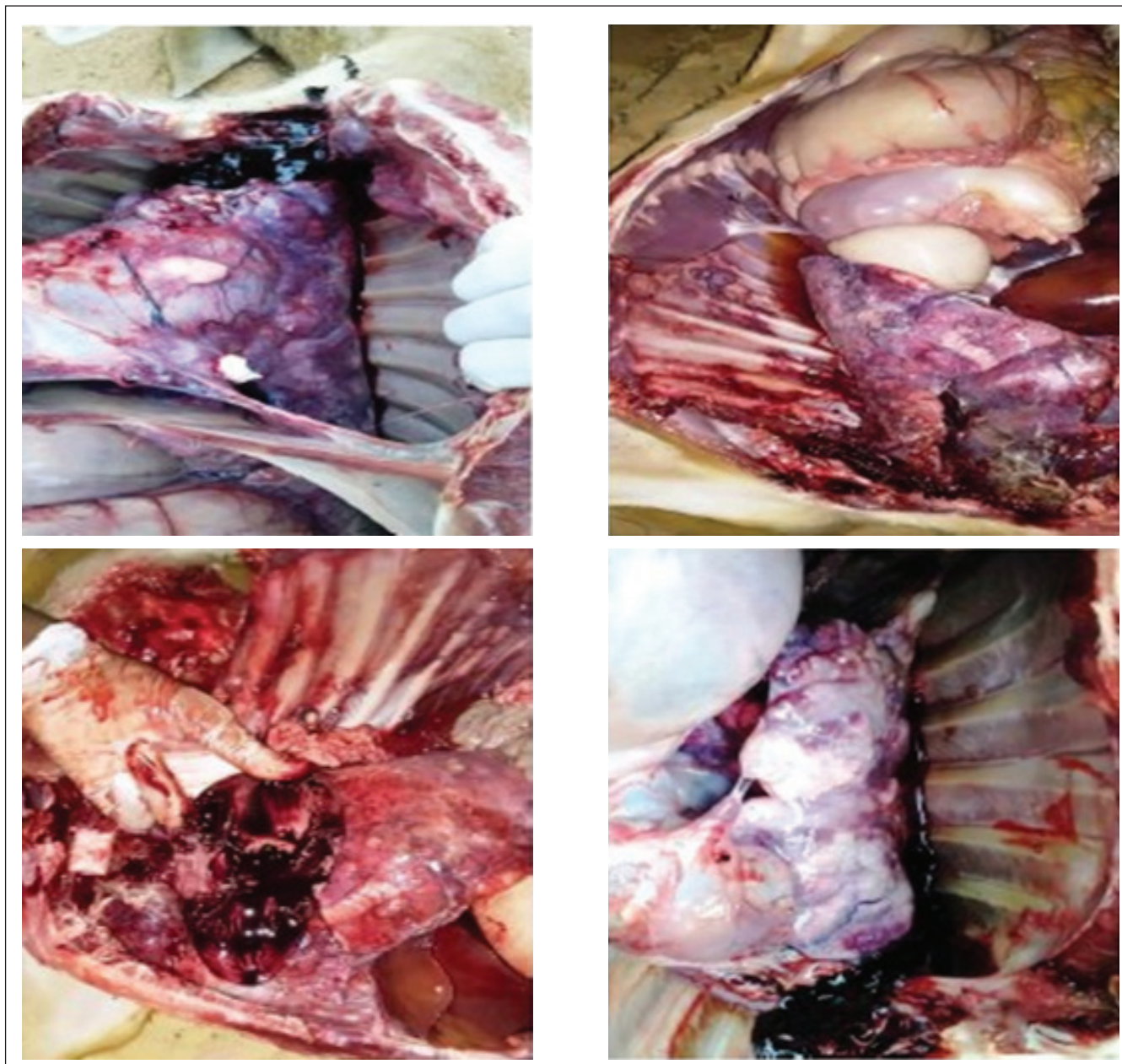


Fig. 1. Post Mortem findings of some animals.

to the Institute of Animal Health and Veterinary Biologicals (R&T), Kolkata, India, and also to the Indian Veterinary Research Institute, Eastern Regional Station (ICAR) Kolkata, West Bengal, India. From both laboratories, confirmation of the presence of MTB substances was reported. Viewing all the physical signs, symptoms, post-mortem findings, and laboratory reports, it was assumed that the animals were suffering from chronic tuberculosis.

Treatment

Considering the zoonotic importance of the disease and the presence of animals in *ex-situ* in the zoo, it

was decided to treat the entire herd of the spotted deer. Isoniazid 300 mg, Rifampicin 600 mg, Pyrazinamide 1500 mg, Ethambutal 900 mg, Streptomycin 900 mg, Bestmin gold Powder 15 gm. were given to all adult animals daily for three months. The routine deworming practice was continued in that period [4].

Screening was also done by sending blood samples, nasal swabs, and environmental samples to the Institute of Animal Health and Veterinary Biologicals (R&T), Kolkata, India after each month of treatment to assess the status of MTB complex in the herd. The samples showed negative results.

Though captive, but reared in a wide range like free-ranging animals and also due to the characteristics of the spotted deer, it was a challenging work to identify the infected animal by tuberculin test individually. It was also very difficult to separate the infected from the others to take proper measurements against the disease. So the entire herd was treated. Considering the zoonotic importance of the disease, the zoo keepers and the persons closely associated with the herd were kept under screening for any possible infection of that organism [5, 6].

The problems of high death rate and emaciation of the animals were not found afterward. So, it was concluded that the treatment was effective in getting rid of that serious health hazard among the spotted deer in the Jungle Mahal Zoological Park, Jhargram, West Bengal, India. In India, reports of infection of MTB among spotted deer are scarce [7] and the present observation is the first such report from West Bengal, India.

REFERENCES

1. Kaneene JB, Miller R, de Kantor IN, Thoen CO. Tuberculosis in wild animals. *Int J Tuberc Lung Dis.* 2010; 14(12): 1508-1512.
2. Palmer MV, O'Brien DJ, Griffin JF, Nugent G, de Lisle GW *et al.* Tuberculosis in wild and captive deer. In: Mukundan H, Chambers MA, Waters WR, Larsen MH (Eds.). *Tuberculosis, Leprosy, Mycobacterial Diseases Man Animals* (Chapter 9). 2015; CAB International, 334-364, DOI: 10.1079/9781780643960.0334.
3. Chu CS, Yu CY, Chen CT, Su YC. *Mycobacterium tuberculosis* and *M. bovis* infection in Feedlot deer (*Cervus unicolor swinhoei* and *C. nippon taiouanus*) in Taiwan. *J Microbiol Immunol Infect.* 2012; 45(6): 426-434, DOI: 10.1016/j.jmii.2011.12.022.
4. Hall RG, Leff RD, Gumbo T. Treatment of active pulmonary tuberculosis in adults: current standards and recent advances. *Insights Soc Infecti Dis Pharmacis Pharmacother.* 2009; 29(12): 1468-1481, DOI: 10.1592/phco.29.12.1468.
5. Montali RJ, Mikota SK, Cheng LI. *Mycobacterium tuberculosis* in zoo and wildlife species. *Rev Sci Tech.* 2001; 20(1): 291-303, DOI: 10.20506/rst.20.1.1268.
6. Epstein JH, Price JT. The significant but understudied impact of pathogen transmission from humans to animals. *Mt Sinai J Med.* 2009; 76(5): 448-455, DOI: 10.1002/msj.20140.
7. Hota SR, Sahu SK, Behera BK, Pahari A, Sahoo N. Microbiological and molecular diagnosis of *Mycobacterium tuberculosis* infection in Spotted deer (*Axis axis*) of an Indian Zoo. *Int J Curr Microbiol App Sci.* 2020; 9(6): 844-851, <https://doi.org/10.20546/ijcmas.2020.906.107>.

Cite this article as : Datta C, Mondal S, Fareed JS. Occurrence and elimination of *Mycobacterium tuberculosis* substances in spotted deer (*Axis axis*) at Jungle Mahal zoological park, Jhargram, India. *Explor Anim Med Res.* 2024; 14(1), DOI: 10.52635/eamr/14.1.158-160.