



## Management of Filariasis in Asian Elephants (*Elephas Maximus*) Under Field Conditions

Dayashankar<sup>1</sup> and Rakesh Kumar Singh<sup>2\*</sup>

<sup>1</sup>Veterinary Surgeon, Dudhwa National Park, Palia, Kheri, U.P, India

<sup>2</sup>Department of Animal Husbandry, Dy. Chief Veterinary Officer, Meerut, U.P, India

\*Corresponding Author: Rakesh Kumar Singh, Department of Animal Husbandry, Dy. Chief Veterinary Officer, Meerut, U.P, India.

Received: March 09, 2023

Published: April 11, 2023

© All rights are reserved by Dayashankar and Rakesh Kumar Singh.

### Abstract

Dudhwa Tiger Reserve (DTR) represents one of the few remaining examples of a highly diverse and productive Terai ecosystem, supporting large number of endangered species, obligate species of tall wet grasslands and species of restricted distributions. DTR is proud owner of 24 elephants maintained at five elephant camps very well under wildomestic condition. Filariasis is one of the common diseases of animal as well as that of human beings. Elephants also suffer from cutaneous filariasis or haemorrhagic filariasis or parasitic dermatorrhagia caused by *Indofilaria pattabiramani* and *I. elephantis* respectively. One female elephant aged around 20 years, weighing approximately 2700 kg whenever used for work was repeatedly showing acute nodule formations on belly which used to subside subsequently. The intensity and number of nodules increased gradually and were very quick to appear after field work with elephant. Due to itching of nodules the elephant used to rub them on tree trunks as a result of which nodules ruptured and small amount of blood oozed from them. The disease was diagnosed as Cutaneous filariasis. The elephant was given injection Ivermectin subcutaneously at tail region and subscapular folds @ 0.3 mg per kg body weight with a 16 gauge needle. A total of 40 ml ivermectin (20 mg per ml concentration) was injected at a time at two regions as discussed. The injection was repeated after seven days with same dose. The animal fully recovered after two injections.

**Keywords:** Filariasis; Endoparasites; Elephants; Ivermectin; Dudhwa National Park (DNP); Dudhwa Tiger Reserve (DTR)

### Introduction

Dudhwa Tiger Reserve (DTR) spread in approximately >2250 km<sup>2</sup>, supports a large number of endangered species. The Dudhwa Tiger Reserve comprises of the Dudhwa National Park (DNP) and the Kishanpur Wildlife Sanctuary. It is located on the Indo-Nepal border in the Lakhimpur Kheri District of Uttar Pradesh. It represents one of the few remaining examples of a highly diverse and productive Terai ecosystem, supporting large number of endangered species, obligate species of tall wet grasslands and species of restricted distribution. Like most parts of northern India, Dudhwa has an extreme Humid Subtropical with dry winter type of climate. The temperature ranges between a minimum of 9.1°C (average) in winter to maximum of up to 40°-45°C in peak summer. Recorded minimum and maximum temperatures are 2.8°C and 45°C. The grasslands comprise about 19% of the park. The wetlands constitute the third major habitat type and include the rivers, streams, lakes and marshes [2,5].

The Asian Elephants (*Elephas maximus*) are one of the creatures whom DTR is nurturing very carefully in wild. To manage and monitor such a vast area and rich biodiversity DTR is maintaining 24 elephants at five elephant camps very well under wildomestic condition [2].

Filariasis is one of the common parasitic diseases of animals and man caused by a small group of filarid nematodes throughout the world. This disease is highly prevalent in hot and humid areas of India especially hilly parts of Tarai region of Uttar Pradesh and coastal areas of Andhra Pradesh, [4].

Menon 1936 quoted that filarial infections have been recorded in India as early as the sixth century B.C. by the famous physician Susruta in Chapter XII of the Susruta Sanihita as mentioned by Raghavan 1957 [6].

Study among 579 captive zoo elephants revealed that Asian elephant (*Elephas maximus*) mainly suffered from wound, debility, anorexia, diarrhoea, tympany, conjunctivitis, pyrexia, ascites, abscess, lameness, footrot, strongylosis, fasciolosis, tick infestation, tuberculosis, dermatitis and stress. Solitary case of death was due to bloat in the Bannerghatta National Park. However, among infective diseases rabies, foot and mouth Disease, pox, tuberculosis, anthrax, haemorrhagic septicaemia, tetanus, black quarter (Single case report from Assam State Zoo, 2005), foot rot, actinomycosis, colibacillosis, trypanosomosis, fasciolosis, amphistomosis, anoplocephalosis, strongylosis, stephanofilariasis were reported [8].

### Case Study

One female elephant aged around 20 years, weighing approximately 2700 kg whenever used for work was repeatedly showing acute nodule formations on belly which used to subside subsequently. Initially it was thought to be some wild plant allergic reaction. However, on examination the elephant was having respiration rate of 15 per minute, 23 to 25 pulse and fresh dung temperature was 98 to 99 °F. The intensity and number of nodules increased gradually and were very quick to appear after field work with elephant. Due to itching of nodules the elephant used to rub them on tree trunks as a result of which nodules ruptured and small amount of blood oozed from them.

### Diagnosis

Fresh blood was taken from nodule after aseptic incision at 1.00 PM for examination. Slide was examined under microscope and live microfilariae were observed. The disease was diagnosed as "Cutaneous filariasis".

### Treatment

The elephant was given injection Ivermectin subcutaneously at tail region and subscapular folds @ 0.3 mg per kg body weight with a 16-gauge needle. A total of 40 ml ivermectin (20 mg per ml concentration) was injected at a time at two regions as discussed. The injection was repeated after seven days with same dose. The ruptured nodules were dressed with antiseptic solutions regularly. Fly repellent antiseptic ayurvedic preparation was also applied after each dressing.

### Results and Discussion

Elephants also suffer from cutaneous filariasis or haemorrhagic filariasis or parasitic dermatorrhagia caused by *Indofilaria patabiramani* and *I. elephantis* respectively. This parasite can affect all animals irrespective of age, sex and body weight. In our case the female was about 20 years old and was diagnosed with cutaneous filariasis [1].

The disease is characterized by nodules of the size of large gooseberry, mostly on the sides, underneath the abdomen and lateral aspects of the hind limbs. The nodules rupture one to two days after their appearance, oozing of blood at about 10 seconds interval for about 30 minutes. Then oozing stops spontaneously. Later, these nodules become fibrosed and new ones emerge at other sites. Authors [3] also described normal physiological parameters of Asian elephants as under

### Respiration

10/minute while standing  
5/minute on recumbency

### Pulse

28/minute while standing  
35/minute on recumbency

### Rectal temperature

35.9°C (96.6°F)

In our case respiration rate was increased and pulse was slightly low and temperature was elevated as compared to above. Which clearly indicates some infective condition. The nodules were also reported on sides and underneath the abdomen. However, no nodule was seen on lateral aspects of hind limb.

A nodule appears on the skin at the sides underneath the abdomen and less frequently on the neck, chest, and outer aspect of thigh. Nodules are one cm thick, 1-2 cm in diameter. The nodules appear at a rate of 4-10 per day and up to 270 nodules has been reported during a period of 6 weeks. About 5-10 ml of blood passes out from each nodule during hotter times of the day. The oozing blood contained large number of microfilaria. The disease is seen through out the year and mostly during months of October and April [1]. Cutaneous filariasis is very commonly seen during the summer months [3].

Our case also corresponds with above; however, no nodules were seen on neck and outer aspect of thighs. The nodule size also varied between one to two cms and little amount of blood too oozed out, and same blood was used for microscopy. Coincidentally the elephant in question also suffered from disease in the month of October.

Arsenical preparation (Acetylarson) 30-40ml, S/C five injection should be given on alternate days. If treatment is further needed, should be continued after a week, Anthiomaline - 50 ml/2000 kg

s/c, 6-10 Injection and control of flies with Insecticides, fly repellents and frequent application of neem oil around the haemorrhagic nodule helped to prevent the biting of flies [1]. However, authors as per experience in bovines successfully used injection ivermectin in this case, as discussed in treatment section and the injection was repeated after seven days to kill new microfilariae. Ayurvedic fly repellent prevented maggot formation and infection of the open nodules.



**Figure 1:** Ruptured nodules with blood oozing.

If animal doesn't allow application of fly repellent or antiseptic lotion then remote wound dressing method will be more useful [7].

### Conclusion

Looking at the prevalence of filariasis among animals and elephants the method used by the authors is practically very easy and useful in diagnosis and treatment of filariasis not only in elephants but also in other herbivores.

### Acknowledgement

Authors pay their sincere gratitude towards Field Directors, Dudhwa National Park; Dy Director, Dudhwa Tiger Reserve, India; Dean, College of Veterinary Science, ND University of Agriculture and technology, Kumarganj, Ayodhya, India and Dr. VK Pal, Assistant Professor, Department of Parasitology, College of Veterinary Science, ND University of Agriculture and technology, Kumarganj, Ayodhya, India for providing necessary facilities for the diagnosis, treatment and management of above animal.

### Conflict of Interest

All the authors declare no conflict of interest.

### Bibliography

1. Arunachalam K, *et al.* "Parasitic Diseases in Indian Elephants-Review *Elephas maximus indicus*". *Zoo's Print* (1996): 1-4.
2. Dayashankar, *et al.* "An Overview Of Successful Breeding Among Semi-captive Asian Elephants (*Elephas maximus*)". Abstract in the Souvenir Book of 8th International Conference on "Wildlife - Bioscience, Biotechnological Innovations and Avant-garde Genetic Technologies" (WBBIAGT 2023) organized by Department of Animal Genetics and Breeding, College of Veterinary Sciences and Animal Husbandry, U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura, (UP)-281001, in collaboration with Indian Society of Genetics, Biotechnology Research and Development (ISGBRD) (2023): 2.
3. G Ajitkumar, *et al.* "Healthcare management of Captive Asian Elephants". Director of Extension, Kerala Agricultural University Mannuthy - 680 651, Thrissur (2009).
4. Kumar C., *et al.* "Analysis of methods for the diagnosis of microfilaremia in buffaloes and cattle". *Journal of Veterinary Parasitology* 19.2 (2005):107-110.
5. Kumar S. "Retrieval of forest parameters from Envisat ASAR data for biomass inventory in Dudhwa National Park, U.P., India". Thesis submitted to Indian Institute of Remote Sensing (IIRS) and International Institute for Geoinformation Science and Earth Observation (ITC) in partial fulfilment of the requirements for the Joint Master of Science degree in Geoinformatics, INTERNATIONAL INSTITUTE FOR GEO-INFORMATION SCIENCE AND EARTH OBSERVATION ENSCHEDE, THE NETHERLANDS & INDIAN INSTITUTE OF REMOTE SENSING, NATIONAL REMOTE SENSING CENTRE (NRSC), ISRO, DEPARTMENT OF SPACE, GOVT. OF INDIA DEHRADUN, INDIA (2009).
6. Menon TB. "Curzon Lectures to the University of Madras, Madras" (cited Raghavan, NGS; EPIDEMIOLOGY OF FILARIASIS IN INDIA, (1957)" *Bulletin of the World Health Organization* 16 (1935): 553-579.
7. Singh Rakesh Kumar, *et al.* "Brief description on wound management in one horned rhinoceros in captivity". *Indian Zoo Yearbook* 8 (2014): 123-126.
8. Swarup D., *et al.* "Standards, guidelines and protocol on disease diagnosis and cure of wild animals in Indian zoos". Indian Veterinary Research Institute, Izatnagar and Central Zoo Authority, New Delhi, India (2009).