

Traumatic wound in a free ranging Asian elephant (*Elephas maximus*) Nagappa K¹, Prakash Bhat², Arup Kumar Das³, Bhaskar Chaudhury⁴ and J. L. Singh⁵

Due to the ensuing reduction of the forest area, there are often reports of human-animal conflicts. It is often difficult to trace such animals in the forest and care for them. However, some of the free-ranging animals are rehabilitated and given the necessary veterinary care (Nath *et al.* 2006). A free ranging tusker, aged approximately 40-45 years, was found traumatically injured in the Corbett Tiger Reserve, Ramnagar on May, 2006. On detailed examination using binoculars, multiple traumatic injuries were found evident; the major ones were – antero-posterior oblique wound (about 20 cm long) on the lateral aspect of left metatarsal region; a lacerated wound at the lateral aspect of the stifle region; and a prominent multi-focal wound with irregular and ecchymosed borders on the midline of perineum. There were no premonitory signs of maggot infestation. In spite of such wounds the animal appeared apparently normal, active and able to bear weight. Benzathine Penicillin, reconstituted in pyrogen free sterile water was delivered through dart into gluteus muscle each time darting materials were retrieved after the delivery of the drug. Wounds were irrigated with a jet of potassium permanganate (1:10,000) daily and a jet spray of BHC (0.2%) was advised prophylactically twice weekly to take care of maggots since BHC could be jet sprayed over the wound from a safe distance.

Keeping in view the risk of tranquilization in elephants in free range and constraints with respect to its location i.e. tough forest with undulating geography and vicinity to water and also difficulty in approaching the animal, it was decided not to tranquilize it. Further, the animal showed improvement with normal movement and feeding after the initial endeavor. However, approximately 6 weeks after the initial treatment the free ranging tusker was sighted again in the forest. this time, the tusker was tranquilized (Ketamine-100 + Xylazine 100) using a dart in free range, approached and sandwiched between two kunkis for the treatment. The wounds were thoroughly debrided, irrigated with potassium permanganate and povidone iodine. Oxytetracycline (LA) was injected intramuscularly. Although, there are reservations in some veterinarians with respect to the use of Oxytetracycline in elephants; however, it has been successfully used in both the African and Asian elephants (Mikota and Plumb 2006; Bush *et al.* 1996, 2000).

To take care of the in-appetence that developed subsequently (after 6 weeks) vitamin B-complex and ranitidine were injected. Daily omeprazole was given orally mixed with an offered food (one quitantal fodder, around 3 kg chapaties mixed with molasses and salt) in a semi confined condition. In

spite of this meticulous management the animal succumbed approximately after three months of its initial clinical management. The exact reason for the death was not ascertained and the pachyderm was disposed off as per the norms of the forest department.

References:

- Bush, M., J. P. Raath, V. de Vos and M. Stoskopf (1996).** Serum oxytetracycline levels in free-ranging male African elephants (*Loxodonta africana*) injected with a long-acting formulation. *Journal of Zoo and Wildlife Medicine* 27 (3): 382-385.
- Bush, M., M.K. Stoskopf, J.P. Raath and M.G. Papich (2000).** Serum oxytetracycline concentrations in African elephant (*Loxodonta africana*) calves after long-acting formulation injection. *Journal of Zoo and Wildlife Medicine* 31(1):41-46.
- Mikota, S.K. and D.C. Plumb (2006).** The Elephant Formulary: Oxytetracycline, Elephant Care International. <http://www.elephantcare.org/>
- Nath, I., K.L. Purohit, S.K. Mishra, S.K. Panda, V.S.C. Bose (2006).** Two cases of rehabilitation of recumbent elephants. *Zoo's Print Journal* 21(9): 2417-2418.

Acknowledgement:

Authors express their sincere gratitude to Dr. R. J. Sharma Dean, College of Veterinary & Animal Sciences, Pantnagar, Dr. Srikant Chandola (Chief Wild Life Warden, Dehradun) and Dr. Rajiv Bartari (Director, Corbett Tiger Reserve) for providing all necessary facilities.

***1Ph D scholar, Department of Veterinary Public Health, G. B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand- 263 145 and Author for correspondence**
E-mail: docnagappa@rediffmail.com

²Assistant Professor, Department of Veterinary Clinics

³Associate Professor, Department of Veterinary Surgery & Radiology,
E-mail: arupvet@rediffmail.com

⁴Veterinary Officer, WTA

⁵Associate Professor, Department of Veterinary Clinical Medicine

Seasonal Variation in Prevalence of Helminthic Infection in the Captive Spotted Deer at Nagpur

Pravin Jadhav¹, Kapil Jadhav², Prashant Chavan³, Bahar Baviskar⁴ and D. K. Maske⁵

Introduction

Despite proper care and management, animals in captivity are under constant stress and are prone to parasitic infections and their health status varies with various factors such as management, feeding, environment, sanitation and season. Lots of information is available on gastrointestinal helminthes related to the morphology of parasites, but information stating seasonal variation of helminthes in captive spotted deer (*Axis axis*) is meager. Present study was undertaken to assess the prevalence of gastrointestinal parasitic infections in captive spotted deer.

Methodology

Altogether 200 freshly dropped faecal samples of captive spotted deer were collected from two different places (Balodyan & Maharaj Bag Zoo) in Nagpur region in two different seasons i. e. summer (March to April) & rainy season (June to July) of the year 2007. Fifty samples were collected randomly from each place in each season. The faecal samples were collected in clean sterile containers and examined in laboratory by sedimentation method. The ova of helminthes were identified on the basis of morphology as reported by Soulsby (1982).

Results and Discussion

The incidence and percentage of helminthic infection in captive spotted deer (*Axis axis*) is presented in the Table 1. In almost all the animals mild to moderate infections were seen without apparent clinical symptoms. The examination of faecal samples of these captive spotted deer showed the presence of ova of *Strongyloides* sp. which was also observed by Maske *et al.*, (1990) and Hussain *et al.*, (2002) at the same place. They also reported the presence of ova of *Strongyles* sp., *Haemonchus* sp. & *Oesophagostomum* sp. in the captive spotted deer (*Axis axis*). The ova of *Trichuris* sp. were also reported during faecal examination and similar reports have been made in captive spotted deer by Kashid *et al.* (2003) and in captive wild herbivorous by Chakraborty (1992). *Trichuris* sp. infection in captive wild herbivorous has also been reported by Varadharajan & Kandasamy (2000), & Hussain *et al.* (2002). Kashid *et al.* (2003) observed 100% helminth infection in spotted deer at Balodyan deer park. In present investigation *Strongyloides* infection was found predominant in both the season. Highest percentage of strongyloides infection has also been recorded by Varadharajan and Kandasamy (2000). All the animals examined shared the common pasture and pens and drinking water sources. Altogether higher prevalence of endoparasitic

infection was recorded in the rainy season. Similar observations were reported by Hussain *et al.* (2002) and Chavan *et al.* (1973). Most of the infections were with a single species and combination of two species occurred rarely. Infection in the order of prevalence was *Strongyloides*, *Strongyle*, *Haemonchus*, *Pesophagostomum* and *Trichuris* sp. Parasitic infection has certain ill effects on health status of the animal such as weakness and emaciation and predisposes those animals to other potential pathogens. Complete eradication of helminthes infection seems difficult therefore periodic treatment of helminthic infections is highly recommended for better health management of captive wild animals.

Conclusion

Conducting regular epidemiological survey of the captive wild animals to study the prevalence of parasitic infections seems indispensable as it will help to curb the losses occurring due to parasites by undertaking effective control measures.

References:

Chakraborty, A. (1992). *Trichuris* sp. infection in wild captive herbivores. *Journal of Veterinary Parasitology* 6(2):37-40.

Chauhan. P. P. S., B. B. Bhatia, G. S. Arora, R. D. Agrawal and S. S. Ahluwalia (1973). A preliminary survey of parasitic infection among mammals and birds at Lucknow and Delhi zoos. *Indian Journal of Animal Science* 43 (2):163-168.

Hussain K., D. B. Sarode, N. P. Dakshinkar, A. M. Rode, M. D. Kotheekar and D. K. Maske (2002). Prevalence of helminthic infection in *Axis* deer at Nagpur 79: 1313-1314.

^{1,2}C/o K. P. Bondre, 209, Gokulpeth, Near Aradhana complex, Nagpur
E-mail: jadhavpa_1403@rediffmail.com,
E-mail: krjadhav_2007@rediffmail.com.
³Taj nagar, Post: Digras, Tal- Digras, Dist. Yavatmal
Email: pcanand@rediffmail.com.

⁴Corresponding Author: C/o S. V. Baviskar, Hanuman Peth, Post. Sakali, Tal. Yawal, Dist. Jalgaon
E-mail: drbaharbaviskar@gmail.com.

⁵Department of Veterinary Parasitology, Nagpur Veterinary College, Seminary Hills, Nagpur. Dist. Nagpur (MS) 440006.

Table 1: The incidence and percentage of helminthic infection in captive spotted deer (*Axis axis*).

Sr. No.	Type Of Helminthic infection found	SUMMER SEASON				RAINY SEASON			
		Balodyan		Maharaj Bagh zoo		Balodyan		Maharaj Bagh zoo	
		No of positive cases	In (%)	No of positive cases	In (%)	No of positive cases	In (%)	No of positive cases	In (%)
1	<i>Strongyloid sp.</i>	13	26%	10	20%	16	32%	18	36%
2	<i>Strongyle sp.</i>	09	18%	11	22%	10	20%	11	22%
3	<i>Hemonchus sp.</i>	06	12%	04	08%	06	12%	08	16%
4	<i>Oesophagostomum sp.</i>	02	04%	-	-	02	04%	04	08%
5	<i>Trichuris sp.</i>	-	-	-	-	04	08%	02	04%

Kashid, K. P., G. B. Shrikhande and G. R. Bhojne (2003). Incidence of gastrointestinal helminths in captive wild animals at different locations. *Zoo's Print Journal* 18(3):1053-1054.

Maske, D. K., M. R. Sardey and N. G. Bhilegaonkar (1990). Helminth parasites in zoo animals of Maharaj Bag, Nagpur, Maharashtra state. *Indian Journal of Animal Science* 60(8):952 pp.

Soulsby, E. J. L. (1982). *Helminths, Arthropods and*

Protozoa of Domestic animals. Lea and Febiger, Philadelphia. 808-815 pp.

Varadharajan, A. and A. Kandasamy (2000). A survey of gastro-intestinal parasites of wild animals in captivity in the V.O.C. Park and Mini Zoo, Coimbatore. *Zoo's Print Journal* 15(5): 257-258 pp.

Acknowledgement:

The authors are thankful to the Associate Dean, Nagpur Veterinary College, Nagpur for providing necessary facilities.

Sightings of rare butterfly species and a new record from Sanjay Gandhi National Park, Mumbai and Tungreshwar Sanctuary, Thane, India

Amol Patwardhan*

Sanjay Gandhi NP (SGNP) is spread over 103 sq km in Mumbai suburban and Thane districts. To the north of SGNP lies Tungreshwar sanctuary (TWLS) spread over 85 sq km in Thane district. Chaturvedi and Kehimkar recorded approximately 140 species from SGNP (*personal communication*). The comprehensive butterfly list of TWLS has not been reported till now. Gaonkar (1996) reported 330 species from the entire Western Ghats and 208 species from North Western Ghats in Maharashtra. The park was visited twice a month while Tungreshwar WLS was visited less frequently. The butterflies were observed along the paths inside the forest. The places are being regularly visited since 1999. Butterflies were identified using Kunte (2000), Haribal (1992), Wynter Blyth (1957) and Evans (1932).

Sightings of rare species.

The status 'rare' refers to only the said area and not for the entire geographical range.

1. Redspot *Zesius chrysomallus* Hübner 1819
Bell (1919) reported from place called 'Malda', now known as Malad which is one of the western

suburbs of Mumbai. Wynter Blyth (1957) reported it from 'Bombay' which could be the same locality. de Niceville (1890) reported it from Alibag, District Raigad.

I photographed one female (Photo 1 and 2*) on 22nd February 2009 from Nagla block adjoining Ulhas river estuary. It was mud puddling on wet soil along with other lycaenids and pierids. I could manage to get photographs. The butterfly was wary and flew at the slightest of the movement on my part. However the flight was slow and she settled again on nearby branch.

2. White Tufted Royal *Pratapa deva* Moore, 1857
Gaonkar (1996) reported it as 'Rare' from northern Western Ghats. Evans (1932) and Winter Blyth (1957) reported it as 'rare in south India'. de Niceville (1890) reported it from "Canara" (now Uttar Kannada District in Karnataka).

*5, Koustubha CHS, B.P. Deshpande Road, Vishnunagar, Naupada, Thane 400602
E-mail: amolppatwardhan@gmail.com



Photo 1. Redspot *Zesius chrysomallus* UN



Photo 2. Redspot *Zesius chrysomallus* female UP

I photographed one specimen (Photo 3 and 4*) on 25th February 2007 in Nagla block, SGNP. It had just eclosed from the chrysalis. It had pupated at the height of two feet from the ground on Kusum *Schliechera olosa*. After few minutes it flew to tree top for basking where I saw blue upper side without black coastal areas. It was a male, as evidenced by the bulge near costa on the hind wing, produced by the hair tuft (Photo 4*).

3. Small salmon Arab *Colotis amata* Fabricius, 1775

This species is found in the estuarine and creek region where its caterpillars feed on Meswak *Salvadora persica*. In Nagla block of SGNP it is very common along estuarine forests but never seen away from the creek.

Its presence in Yeoor block is uncommon. Yeoor is a hilly area at an altitude of approx. 300 ft. above sea level. I saw it twice. First sighting was on 10th October 2004 (Photo 5 and 6*) and second on 2nd

November 2008

4. Red Helen *Papilio helenus* Linnaeus, 1758

It was reported from Malabar hill, Mumbai by Aitken and Comber (1903) and from Ghodbunder, Thane by Best (1951). There are records of Red Helen from Bhimashankar WLS during monsoon season (*pers. comm.* Krushnamegh Kunte). Also I have seen it in Phansad WLS, district Raigad in October 2004.

I saw one individual came down from tree top and tried to feed from bright tobacco wrapper for few seconds and then flew off. This was on 13th July 2008 at TWLS. I could not photograph it.

New record to the area

1. Chocolate albatross *Appias lycida*

Boisduval, 1836

The northern most limit of this species in the Western Ghats appears to be Phansad WLS in



Photo 3. White tufted royal *Pratapa deva*



Photo 4. White tufted royal *Pratapa deva* UN



Photo 5. Small salmon Arab *Colotis amata* UN



Photo 6. Small salmon Arab *Colotis amata* UP



Photo 7. Chocolate albatross *Appias lynceida*



Photo 8. Chocolate albatross *Appias lynceida*

Raigad district which is almost 100 km south of Mumbai. On 29th October 2006 I saw a male feeding on the wild flowers (Photo 7*). Another male, a worn specimen, was seen on 2nd November 2009 (Photo 8*). Both of these sightings were in Yeoor block of SGNP.

Discussion

These rare butterflies have not been reported from the study area recently. The present sightings are also not continuous hence it proves the 'rare' status. According to Bell (1919) the caterpillar of Redspot *Z. chrysomallus* are predatory on ants. I am yet to see the caterpillar. It is probably an elusive species. However species like White Tufted Royal *P. deva* can be easily mistaken for the similarly patterned Peacock Royal *Tajuria cippus*. The food plant for Small Salmon Arab *C. amata* from the inland forests and hilly area is not reported yet. The probable reason for its occurrence is that it could have been carried by the wind drift as Yeoor is only 2 km from Thane creek. Red Helen *P. helenus* has been reported from the area but there are no authentic reports on its sightings near

Mumbai in the recent past. It might be confused with Common Mormon *P. polytes* by a beginner. Its caterpillar feed on the plants of Rutaceae which are fairly common in the study area however I have not seen any caterpillars.

The presence of Chocolate Albatross *A. lynceida* is inexplicable at this point of time. It was sighted only during post monsoon (Oct-Nov) in 2006 and 2008. It is probably migrating northwards during this season. Since it is a forest insect, its presence or absence at places like Matheran and Karnala Bird Sanctuary should be confirmed, since the forests in these places are denser than in SGNP and therefore likely to support this species. In the study area it is not observed during the rest of the year though some of the Capparaceae plants are present on which its caterpillars feed.

References:

Aitkin, E. H. & E. Comber (1903). A list of Butterflies of Konkan. *Journal of Bombay Natural History Society*. 15: 42-55 pp.

Bell, T. R. (1919). The common butterflies of the plains of India (including those met with in the hill

stations of the Bombay Presidency). Part 22. *Journal of the Bombay Natural History Society*, 26(2):438-487 pp.

Evans, W.H. (1932). *Identification of Indian Butterflies*. 2nd Edition Revised. Bombay Natural History Society (1985 reprint). x + 1-454 pp.

Gaonkar, H. (1996). Butterflies of the Western Ghats, India (including Sri Lanka): A biodiversity assessment of a threatened mountain system. Report to the Centre of Ecological Sciences, Bangalore. 86 pp.

Haribal, M. (1992). *The Butterflies of Sikkim Himalaya*

and Their Natural History. Sikkim Nature Conservation Foundation, Gangtok. 217 pp.

Kunte, K. (2000). *Butterflies of Peninsular India (India: A Lifescape)*. Universities Press, Hyderabad. 272 pp

de Niceville, L. (1890). *The Butterflies of India, Burmah and Ceylon*. Vol. III. A. J. Reprints Agency, New Delhi. 503 pp.

Wynter Blyth, M. A. (1957). *Butterflies of the Indian Region*. Reprint 1982, Today and tomorrow publisher, New Delhi. 523 pp.

Antibiogram of various wounds in Captive Asian Elephants of Tamil Nadu - An Overview

K. S. Subramanian¹ and S. Ranjani²

A study was conducted on captive Asian elephants maintained by state forest department and various temples of Tamilnadu for a period of ten months from February 2008 to December 2008 to identify the microbial fauna of wounds in different parts of their body. Cultural examination and biochemical tests of 119 samples revealed the presence of wide spectrum of both aerobic and anaerobic organisms. Gentamycin, Chloramphenicol, Enrofloxacin, Ciprofloxacin and Neomycin showed broad spectrum of susceptibility in order towards various aerobic organisms and Chloramphenicol, Ciprofloxacin, Gentamycin, Enrofloxacin and Amoxicillin were found to show broad spectrum of susceptibility in order towards various anaerobic microorganisms.

Occurrences of wounds are common in elephants due to their exposure to different husbandry conditions and unhygienic environments resulting in various bacterial infections such as foot infections, nail infections, hip wound, shoulder abscess, elbow abscess etc., Though there were case reports on the incidence of organisms such as *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococci*, *E. coli* (Arora, 2003; Mikota *et al*, 1994), *Aeromonas* and *Citrobacter* (Fowler, 2006) from various wounds in elephants, there is no systematic study on the microbial fauna involved in the wounds of captive Asian elephants of Tamilnadu. This paper reports about the presence of microorganisms and their susceptibility towards various antibiotics isolated from different wounds in captive Asian elephants.

Materials and Method

About 119 samples from various lesions on the body of the captive Asian elephants of Tamilnadu were collected using a special transport medium. The samples were plated in both selective and differential media and incubated for 24 to 48 hrs. Biochemical tests (IMVIC) were carried out for identification of specific organism. The isolates were subjected to antibiogram testing using Kirby-

bauer disk diffusion method.

Results and Discussion

Cultural examination and biochemical tests of the samples collected from various wounds on the body of elephants revealed the presence of wide spectrum of both aerobic and anaerobic organisms (Table 1). The organisms isolated from the hip wound includes *Streptococci*, *E.coli*, *Klebsiella* and *Pseudomonas* spp which were sensitive to Gentamycin, Chloramphenicol, Ciprofloxacin and Enrofloxacin. The samples collected from the elbow abscess revealed presence of *Staphylococci*, *Bacillus*, *Pseudomonas*, *Streptococci* and *Klebsiella* spp which were sensitive to Gentamycin, Chloramphenicol, Ciprofloxacin, Ampicillin-A, Neomycin and Enrofloxacin. The anaerobic etiology includes *Clostridium*, *Peptostreptococci* and *Bacteriodes* spp which were sensitive to Chloramphenicol, Ciprofloxacin, Gentamycin and Enrofloxacin.

The samples collected from the shoulder abscess revealed presence of *Klebsiella*, *Streptococci*, *Bacillus* and *Proteus* spp which were found sensitive to Amoxicillin, Gentamycin, Chloramphenicol, Neomycin and Erythromycin. The culture from the different wounds in the hind quarters revealed presence of *Bacillus*, *Pseudomonas* and *Streptococci* spp of aerobes which were sensitive to Gentamycin, Chloramphenicol, Ciprofloxacin and Enrofloxacin (Table 2).

The anaerobic culture of the samples collected from foot lesions and the wounds in the hind quarters revealed the presence of *Peptostreptococci* spp which was found to be sensitive to

¹Department of Wildlife Science, Madras Veterinary College, Vepery, Chennai - 600 007. Email: drkswildlifvet@gmail.com



Specimen collection from Temporal Abscess in an elephant



Chronic fistulated wound in the hind leg



Bed side wound in an elephant



Severe Foot rot in an elephant



Necrotic wound in between the nail



Necrotic wound in nail and cuticle

Chloramphenicol, Ciprofloxacin and Gentamycin (Table 3).

Conclusion

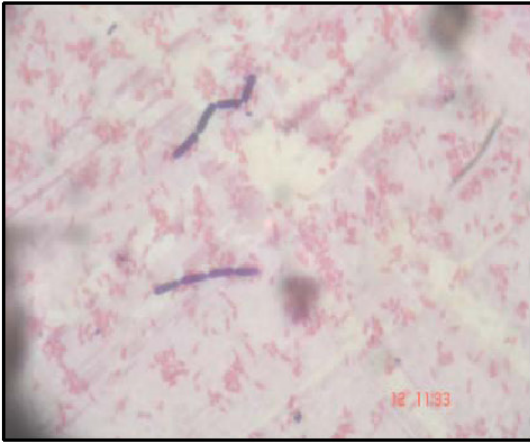
The above study revealed that the antibiotics such as Gentamycin, Chloramphenicol, Enrofloxacin, Ciprofloxacin and Neomycin showed broad spectrum of susceptibility towards various aerobic organisms and Chloramphenicol, Ciprofloxacin, Gentamycin, Enrofloxacin and Amoxicillin were found to show broad spectrum of susceptibility towards various anaerobic microorganisms

encountered in various wounds of captive Asian elephants.

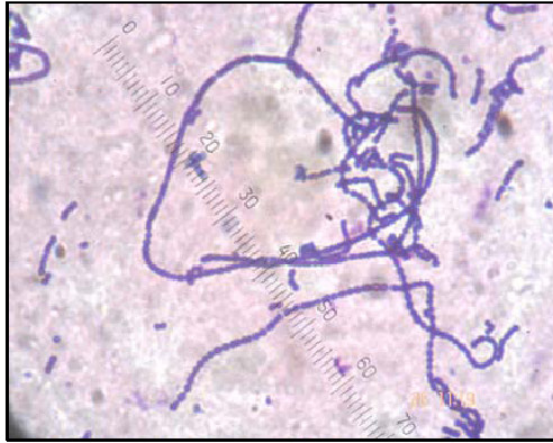
This study also emphasizes that the approach to the wound treatment and medication in elephants should be based on periodic culture and sensitivity at different stages of the wound based on the progress of treatment which facilitates early healing with least stress to the elephant.

Acknowledgement:

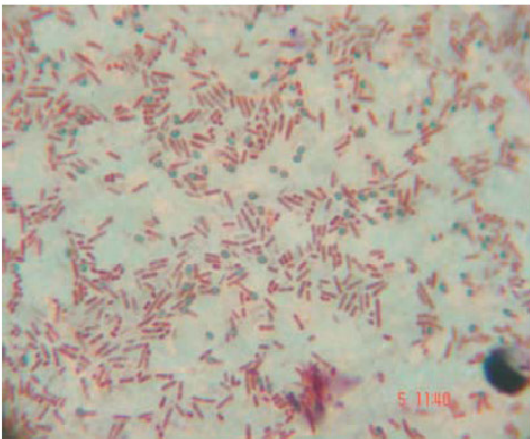
The authors are thankful to Central Zoo Authority for the funds, TANUVAS for the facilities provided



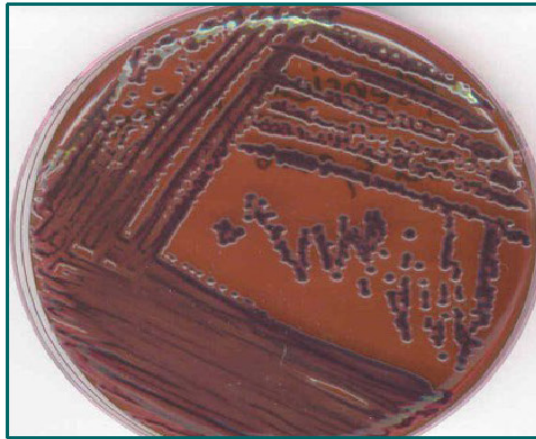
Clostridium spp : Grams Stain (100 X)



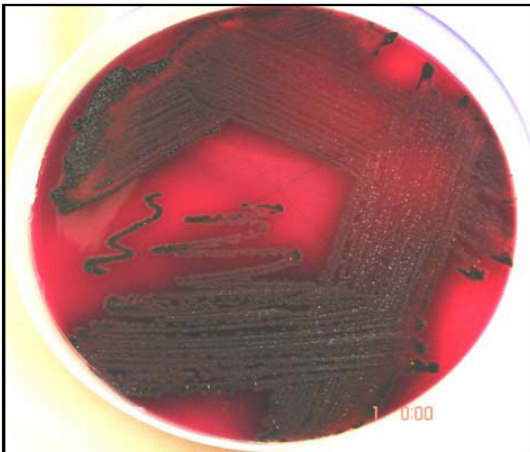
Streptococci spp : Grams stain (100 X)



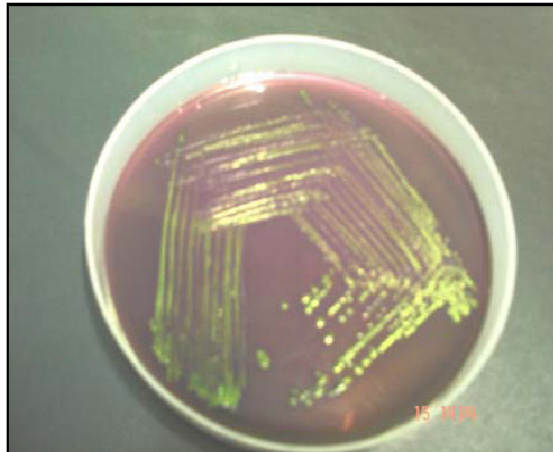
Bacillus spp (Spore forming bacillus)
Schaffers Fulton stain (100 X)



Klebsiella spp : in MacConkey medium



Salmonella spp : in XLD medium



E. coli : in Eosine Methylene blue medium

Table: 1. Lesion wise organisms encountered

Infected site	Organisms encountered
Hip wound	<i>Streptococci</i> spp, <i>Klebsiella</i> spp, <i>Pseudomonas</i> spp, <i>Staphylococcus</i> spp and <i>Peptostreptococci</i> spp.
Elbow abscess	<i>Staphylococcus</i> spp, <i>Streptococci</i> spp, <i>Klebsiella</i> spp, <i>Pseudomonas</i> spp, <i>Clostridium</i> spp, <i>Peptostreptococci</i> spp and <i>Bacteriods</i> spp.
Shoulder abscess	<i>Klebsiella</i> spp, <i>Streptococci</i> spp and <i>Proteus</i> spp.
Lesions from hind quarters	<i>Pseudomonas</i> spp and <i>Streptococci</i> spp.
Necrotic Wound	<i>Staphylococcus</i> spp, <i>Bacillus</i> spp, <i>Klebsiella</i> spp, <i>Streptococci</i> spp, <i>Clostridium</i> spp and <i>Bacteriods</i> spp.
Nail lesions	<i>Staphylococcus</i> spp, <i>Bacillus</i> spp, <i>Klebsiella</i> spp, <i>Streptococci</i> spp, <i>E.coli</i> , <i>Proteus</i> spp, <i>Pseudomonas</i> spp, <i>Salmonella</i> spp, <i>Clostridium</i> spp and <i>Peptostreptococci</i> spp.
Foot rot condition	<i>E.coli</i> , <i>Staphylococcus</i> spp, <i>Streptococcus</i> spp, <i>Bacillus</i> spp, <i>Clostridium</i> spp and <i>Peptostreptococci</i> spp.
Pad and Sole abscess	<i>Proteus</i> spp, <i>Salmonella</i> spp, <i>Bacillus</i> spp, <i>Streptococci</i> spp and <i>Peptostreptococci</i> spp.

Table: 2. Aerobic micro-organisms isolated

Name of the Organism (Aerobes)	Sensitive to
<i>Staphylococcus</i>	Gentamycin, Neomycin, Enrofloxacin, Chloramphenicol
<i>Streptococcus</i>	Enrofloxacin, Chloramphenicol, Co-trimoxazole.
<i>Bacillus</i>	Gentamycin, Enrofloxacin, Chloramphenicol, Ciprofloxacin
<i>Pseudomonas</i>	Enrofloxacin, Gentamycin, Neomycin.
<i>Klebsiella</i>	Enrofloxacin, Chloramphenicol Gentamycin.
<i>Proteus</i>	Enrofloxacin, Ciprofloxacin, Chloramphenicol.
<i>E.coli</i>	Enrofloxacin, Ciprofloxacin, Chloramphenicol, Gentamycin.

Table: 3. Anaerobic micro-organisms isolated and their antibiogram

Name of the Organism (Anaerobes)	Sensitive to
<i>Bacteriods</i>	Amoxicillin, Gentamycin, Chloramphenicol, Neomycin, Enrofloxacin.
<i>Clostridium</i>	Chloramphenicol, Amoxicillin, Gentamycin, Enrofloxacin.
<i>Peptostreptococci</i>	Ciprofloxacin, Enrofloxacin, Gentamycin, Co-trimoxazole.

and Tamilnadu Forest department and Temples maintaining elephants in Tamilnadu for their co-operation.

References:

Arora, B.M (2003). Indian Wildlife diseases and disorders. First Ed. Association of Indian Zoo and Wildlife Veterinarians, UP. India. Pg; 438.

Mikota S.K, Sargent E.L, Ranglack GS (1994). *Medical Management of Elephants.* Indira Publishing House, West Bloomfield, Michigan. Pp: 137.

Fowler, M.E (2006). Foot Disorders in Biology, medicine and surgery of elephants. Blackwell publishing co, Ames, Iowa, USA. Pp. 271.