PARASITIC STUDY OF CAPTIVE ANIMALS-

SNOW LEOPARDS (*Uncia uncia*) AND RED PANDAS (*Ailurus fulgens fulgens*)


Work conducted from 1-5-2014 to 31-5-2014 by
Namrata Pradhan,

M.Sc, Loyola College, Chennai.

Submitted to,

Mr A K Jha,IFS,

Director of Padmaja Naidu Himalayan Zoological Park,

Darjeeling.

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Date:

Miss Namrata Pradhan
M.Sc. 1st Year(Advanced Zoology & Biotechnology)
Loyala College, Chennai
E mail id: sina_pradhan19@yahoo.com

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Abstract of the work conducted

Parasitic infection causes diseases which constitute one of the major problems in management causing mortality and morbidity in animals under captivity. However in India, data regarding research on parasitic study of captive animals are still at fundamental level. The present report aims at contributing information regarding parasitic study of Snow Leopards (*Uncia uncia*) and Red Pandas (*Ailurus fulgens fulgens*).

A study on the prevalence of parasitic infection in Snow Leopards and Red Pandas in Padmaja Naidu Himalayan Zoological Park, a high altitude zoo in Darjeeling hills, was conducted from 1.5.2014 -31.5.2014 by faecal examination using Direct, Sedimentation and Floatation methods attached as (Annexure VII) (Annexure VIII). Veterinary records on faecal analysis for the past three years from 2011-2013, attached as (Annexure I) (Annexure II) (Annexure III) (Annexure IV) (Annexure V) (Annexure VI) were compiled and analysed.

Objective of the study

This study was undertaken as a part of my M.Sc curriculum in Loyola College Chennai that includes conducting a training programme. The study area that i chose was to study and learn techniques on parasite and parasitological work at Padmaja Naidu Himalayan Zoological Park. I joined the park on 1-5-2014 and after discussion with the Director of the Park my work included

1. Faecal analysis of 17 (9:8) Red Panda and 12 (5:7) Snow Leopard,
2. Data analysis of the past records

Introduction

Parasitic infections in the course of time can be severe to the extent of even causing death of the animals due to which parasitic study of animals already categorised as endangered such as Snow Leopards (*Uncia uncia)* and Red Pandas (*Ailurus fulgens fulgens*) is particularly necessary. Parasitological study helps :

1. To know about the parasitic induced diseases in animals,
2. To learn its causes,
3. Find ways to terminate it and
4. Trace back the primary cause to its source.

Parasitic infections if unchecked leads to:

1. Higher susceptibility to other infections,
2. Condemnations of organs,
3. Lower breeding potential,
4. Higher mortality rate,
5. Poor body growth and
6. Suppressed immunity.

Study Area

Padmaja Naidu Himalayan Zoological Park, popularly known as Darjeeling Zoo is a high altitude zoo situated at an altitude of 2137m (6500 ft). PNHZ Park is categorised as a small zoo (Anon 2001). Located at 27^{o} 03' 32" N and 88^{o}15'47"E , it covers an area of 67 acres. PNHZP presently holds 44 species that includes mammals, herbivores, pheasants, birds and an amphibian. The Park currently has three off display Conservation Breeding Centres. The Park is currently working towards the Conservation Breeding of ten species- Red Panda (*Ailurus fulgens fulgens*), Snow leopard (*Uncia uncia*), Himalayan Wolf (*Canis lupus himalayensis*), Blue Sheep (*Pseudois nayaur*), Himalayan Thar (*Hemitragus jemlahicus*), Satyr tragopan (*Tragopan satyra*), Blood Pheasant (*Ithaginis cruentus*), Grey Peacock Pheasant (*Polypectron bicalcaratum*), Himalayan Monal (*Lophura impejanus*) and Red Jungle Fowl (*Gallus gallus*) .

METHODOLOGY

A. **Reviewing old records**-

The stool test reports from the year 2011-2013 of Snow Leopards (*Uncia uncia)* and Red Pandas (*Ailurus fulgens fulgens)* conducted at Padmaja Naidu Himalayan Zoological Park was compiled for the analysis of the prevalence of parasitic infections. Reviewing of stool test reports were done using following methods:

1. Checking the status of the stool- consistency, colour, presence of blood, mucous and pus cells,
2. Noting the deworming schedule given to the animals,
3. Marking the presence of any parasite or ova.
4. Comparing the degree of parasitic infection between male and female animals.
5. Season of occurrence.

B. **Faecal examination**-

A total of 25 fresh faecal samples of 12 Snow Leopards and 28 of 17 Red Pandas prevailing in Padmaja Naidu Himalayan Zoological Park were collected from 1.5.2014- 31.5.2014 . The samples were then tested for the presence of parasites by Direct Smear, Sedimentation and Floatation techniques as per the standard procedure.

Results and discussion

i. **Review result**-

Out of the 508 stool tests of Snow Leopards (*Uncia uncia*) and Red Pandas (*Ailurus fulgens fulgens*) performed from 2011-2013 in Padmaja Naidu Himalayan Zoological Park, 33 stool reports were found positive for parasitic infection of which 25 were stool reports of Snow Leopards and 8 were of Red Pandas. The animals were specifically positive for *Trichomonas sp, Toxocara sp* and *Ascarids.*

Case study I-

Snow Leopard:

A female Snow Leopard in Padmaja Naidu Himalayan Zoological Park named Ritu born on 11-3-2004 was found positive for parasitic infection thrice during the past three years 2011-2013-
On 7-1-2013 stool test reported positive for Adult *Ascaris sp* (+++)
On 17-1-2013 positive for *Toxocara sp* (+)
On 19-12-2013 positive for *Toxocara sp* (+).
On checking the deworming record of Ritu it was found that Ritu had been given deworming after worms were noticed in its stool on 3-1-2013 and the medicine prescribed was Tab Zolbend (400 mg)-1 tab/day x 3 days. Yet its stool test reported positive for Adult *Ascaris sp* (+++) just four days later,on 7-1-2013 and was prescribed Bol. Fantas (1.5 mg) ½ bol/day x 2 days then for deworming again. Even then just 10 days later to prior deworming,its stool test reported positive for *Toxocara sp* on 17-1-2013 and the medicine then prescribed was Bol Oxzol (2200mg) ¼ bol/day x 2 days. Then after, all following reports were negative until 19-12-2013 positive for *Toxocara sp* (+).
Since parasites were seen and reported in the stool test of Ritu thrice during the month of January 2013 inspite of giving repeated deworming,one of the prime reason could be that Ritu did not take the full dose of the medicine if it was given with the feed. Thus, the zoo keepers are recommended to keep a careful watch to check if the animals have consumed the full dose of the medicine prescribed.

Case study II-

Red Panda:

A female Red Panda in Padmaja Naidu Himalayan Zoological Park named Rigsel born on 28-05-2007 was found positive for parasitic infection thrice during the past three years 2011-2013-
On 21-06-2012 stool test reported positive for adult *Ascaris sp* (+) and *Trichomonas sp* (++++).

On 12-08-2012 stool test reported positive for adult *Ascaris sp* (++) during which deworming medicine prescribed was Tab. Panacur (150mg)-1 tab at once.
On 17-08-2012 adult *Ascaris sp* (++) were reported in the stool test.
Since there was parasite, adult *Ascaris sp* reported just after 5 days of deworming on the month of August in 2013 in Rigsel,it can be assumed that Rigsel did not take up the prior deworming medicine. Thus a check on the consumption of the full dose of medicine prescribed by the animal concerned is a must.

ii. Faecal check result-

Out of the 53 faecal samples tested from 1-5-2014 to 31-5-2014, three were found to be positive for parasitic infection of which 1 faecal sample was of Snow Leopard and two of Red Pandas. The animals were specifically positive for *Ascaris sp* and *Trichomonas sp.*

On discussion with Dr. Pankaj Kumar, Mr Vikash Chettri and Mr Pradip Singh of veterinary section parasitic overload is avoided by conducting monthly stool test of each individual animal for each species present at Padmaja Naidu Himalayan Zoological Park. In case of positive worm infection necessary treatments are given. Post faecal examination is done, which is necessary in assessing efficacy of the initial treatment. Follow-up treatments in every twenty one days cycle is required to remove larval stages not susceptible during the initial treatment. Regular deworming of all animals in every three months is carried on efficiently.
Drugs used at PNHZ Park for deworming :

1. Tab Ivectin
2. Tab Zolebend
3. Tab Plozin
4. Bol. Oxzol
5. Bol. Fants (1.5mg)
6. Tab Pyrateforte
7. Tab Panacur (150mg)

Adult parasites of *Toxocara sp* was also seen in the vomit of Snow Leopard which is a result of parasitic overload. (reported)

Ova of *Toxocara sp*

Ascaris sp

The laboratory facility at PNHZ Park.

Study area

Red Panda *(Ailurus fulgens)*

Snow leopard *(Uncia uncia)*

RECOMMENDATIONS:

There is more occurrence of *Toxocara sp* in Snow Leopards and Red Pandas at Padmaja Naidu Himalayan Zoological Park than any other parasites hence, there should be measures for the removal of intermediate hosts of *Toxocara sp* namely mouse and rodents, which was not observed inside the night shelters or the enclosures but there might be in the surrounding areas of the breeding centres or the display area.

1. Since different parasites infecting the Snow Leopards and Red Pandas have different life cycles, stool test of each animal in the park should be done at least twice a month to keep a check on the incidence of parasitic infections.
2. Inspite of schedule deworming, some individual animals mainly Snow leopards are still infected with parasites, hence the schedule should be discussed and changed after proper research in the life of the frequently occurring species i.e. *Toxocara sp* and *Ascaris sp.* parasite. 'Cyclic deworming" would be a better option.
3. It is important to identify the species of the parasite.
4. Usually when the deworming medicines are given with the feed, there may be times when the medicines are left out with the left over feed. The Zoo keepers should be extremely careful and see that the animal takes the complete dose of the medicine. prescribed.
5. Studies in microflora can be used in the parasitic study of captive animals as it would help to keep a check on the spread of parasitic infections through infected soil.
6. Research on the life cycle, occurrence ,its intermediate hosts and final host of frequently occurring parasites especially *Toxocara sp* and *Ascarids* , in Snow Leopards and Red Pandas of PNHZ Park is required.
7. A well equipped laboratory with an Electron Microscope is essential. The laboratory should be well updated with the utilisation of modern advanced technologies to identify, research and control the occurrence of parasites.
8. Most importantly, exchange of information on parasitic research of captive animals between the high altitude zoos should be carried on regular basis in order to know and control the incidence of parasitic infections in captive animals better.
9. Hygiene and sanitation should be the utmost priority.

CONCLUSION

The present study indicated that there is a low prevalence of parasitic infections in captive animals- Snow Leopards (*Uncia uncia*) and Red Pandas (*Ailurus fulgens fulgens)* in Padmaja Naidu Himalayan Zoological Park. The periodical deworming might be the reason of low incidence of parasitic infection in these animals, found in the study. Padmaja Naidu Himalayan Zoological Park is consistent in conducting regular faecal check of all the species in the Park, yet there are incidental occurrences of parasitic infection in some individuals of snow leopard, thus the work conducted for one month period can be further expanded as a research area on parasite and parasitic infection and find measures to control and eradicate it.

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