

## Study of parasitic infections in non-human primates of Gujarat state, India

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### Abstract

**Aim:** The study was conducted to provide baseline data on faecal parasites in groups of captive and free-living Non Human Primates of Gujarat state.

**Materials and Methods:** Eighty two faecal samples from hanuman langur (*Presbytis entellus*) and fifteen samples from rhesus macaque were analysed from June, 2010 to March, 2011 using sedimentation technique as described by Georgi. Identification of parasitic ova was carried out as described by Soulsby (1982) and Wallach and Boever (1983).

**Results:** Out of these 28 (34.14%) in hanuman langur and 6 (40.00%) in rhesus macaque, were found positive for the presence of total of six parasite species viz. *Strongyloides* spp., *Trichuris* spp., *Entamoeba histolytica* spp., *Ascaris* spp., *Entamoeba coli*, *Spirometra* spp.

**Conclusion:** Incidence of parasitic infection was 34.14% and 40.00% in Hanuman Langur and Rhesus macaque respectively.

**Key words:** Hanuman langur, Non Human Primates, Parasites, *Presbytis entellus*, Rhesus Macaque,

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### Introduction

The exchange of disease is a concern for wildlife conservation both outside and inside the boundaries of parks and reserves. The presence of tourists, researchers and park personnel has created a situation that may facilitate disease transmission between humans, livestock and wildlife [1, 2]. Though, some data is available on parasitic infection in captive Non Human Primates, little or no population data exist for parasitic infections of free living Non Human Primates. The paucity of data, combined with ever increasing human encroachment into previously pristine areas of Neotropical forest, has necessitated this study with the primary objective to provide baseline data on the presence of faecal parasites in groups of Non Human Primates from free living and captive areas of Gujarat state. In the Gujarat state mainly two species hanuman langur and rhesus macaque of Non Human Primates are exist more frequently with a population of 100865 and 6115, respectively [3].

The study of parasitic infection will be useful in understanding the prevalence of parasites as well as to control morbidity and mortality in captive and free living Non Human Primates of the state.

The study was conducted to provide baseline data on faecal parasites in groups of captive and free-living Non Human Primates of Gujarat state.

### Materials and Methods

About 15 gram of fresh stool (faeces) was collected in 10% formalin from each out of 82 Hanuman langur (*Presbytis entellus*) and 15 Rhesus macaque (*Macaque mulatta*) during the period of June, 2010 to March, 2011. The sample collection was done without disturbing the animals. The sample collection of free living animals was carried out from the forest areas of Mount Abu and Ambaji, Anand city and surrounding areas, Gandhinagar city and surrounding areas, Panchmahal district forest areas (Ratanmahal, Jambugoda and Pavagadh), Patan city and surrounding areas whereas sample collection of captive animals was carried out from Indroda park, Gandhinagar, Kamla Nehru Zoological park, Sayaji Baug Zoo- Baroda as well as from Jiv Daya Charitable Trust, Ahmedabad of the Gujarat state.

When an identified individual defecated, faeces was collected immediately and placed in a polythene container containing formalin as fixative. The samples were properly labeled indicating name, age, sex,

Table-1. Overall prevalence of parasites in Hanuman langur (*Presbytis entellus*)

Sr. no	Name of parasites	No. of parasite			Percentage
		Captive	Free living	Total	
1.	Strongyloides spp. (Endoparasite)	2	6	8	26.66
2.	Trichuris spp. (Endoparasite)	2	4	6	20.00
3.	<i>Entamoeba histolytica</i> (Endoparasite)	1	2	3	10.00
4.	Ascaris spp. (Endoparasite)	2	4	6	20.00
5.	<i>Entamoeba coli</i> , (Endoparasite)	2	1	3	10.00
6.	Spirometra spp. (Endoparasite)	1	3	4	13.33
	<b>Total no. of samples</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>100</b>

Table-2. Overall prevalence of parasites in Rhesus macaque (*Macaca mulatta*)

Sr. no	Name of parasites	No. of parasite			Percentage
		Captive	Free living	Total	
1.	Strongyloides spp. (Endoparasite)	1	3	4	26.66
2.	Trichuris spp. (Endoparasite)	2	2	4	26.66
3.	Ascaris spp. (Endoparasite)	1	3	4	26.66
4.	Spirometra spp. (Endoparasite)	1	2	3	20.00
	<b>Total no. of samples</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>100</b>

species and date of collection and were examined at the Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, Anand, using sedimentation technique as described by Georgi [4]. Identification of parasitic ova was carried out as described by Soulsby [5] and Wallach and Boever [6].

#### Results

Out of 82 faecal samples of hanuman langur, 28 (34.14%) and from 15 faecal samples of rhesus macaque, 6 (40%) were found positive for the parasitic infection. Totally six parasite species viz. Strongyloides spp., Trichuris spp., *Entamoeba histolytica* spp., Ascaris spp., *Entamoeba coli*, Spirometra spp., were identified from faecal samples. In hanuman langur, the study revealed high prevalence of Strongyloides spp. (26.66%) followed by Ascaris spp. and Trichuris spp. (20.00%) each, Spirometra spp. (13.33%), *Entamoeba histolytica* (10.00%) and *Entamoeba coli* (10.00%) each. Overall prevalence and diversity of gastrointestinal parasites and their prevalence in captive and free living hanuman langur are presented in Table 1. In the rhesus macaque, faecal examination revealed high prevalence of Strongyloides spp., Trichuris spp. and Ascaris spp. (26.66%) each followed by Spirometra spp. (20.00%).

The infection in Trichuris spp. was found to be highest (40.00%) followed by, Spirometra spp., Ascaris spp. and Strongyloides spp. (20.00%) each in captive macaques and the prevalence of Strongyloides spp. and Ascaris spp. revealed highest (30.00%) each followed by, Spirometra spp. (20.00%) and Trichuris

spp. (20.00%) each in free living rhesus macaque. The data of overall prevalence of parasitic infection and their prevalence in captive and free living rhesus macaque are presented in Table 2.

#### Discussion

The overall low prevalence of parasitic infection in both captive and free living hanuman langur and rhesus macaque may be due to their habit of eating tree leaf tops especially those of medicinal values, like neem tree leaves, which decrease the parasitic load in animals and contribute to the overall general health of monkeys. In captive animals, the lower rate of prevalence could be due to regular screening of stool samples and periodical anthelmintic regimen in most of the Zoos, as per the protocol of Central Zoo authority. The above findings of low prevalence are in agreement with those of Muriki *et al.* [7], Vardhraj and Pythal [8], Muenne *et al.* [9], Legesse and Arko [10] and Lilly *et al.* [11] with low prevalence.

However, our results differed from Murray *et al.* [12], Lisa *et al.* [13], Sanchez *et al.* [14] and Ascaratte *et al.* [15]. The differences in the results may be due to the different species of monkey studied, different location of study, different climatic conditions, different age groups and varied susceptibility of monkeys to the parasites.

#### Conclusion

Incidence of parasitic infection was 34.14% and 40.00% in Hanuman Langur and Rhesus macaque respectively with presence of total of six parasite

species viz. *Strongyloides* spp., *Trichuris* spp., *Entamoeba histolytica* spp., *Ascaris* spp., *Entamoeba coli*, *Spirometra* spp. As per our Knowledge the parasitological infection values in captive and free living hanuman langur and rhesus macaque in Gujarat reported for the first time in the current study may serve as a guideline for future studies in the same species.

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#### Competing interests

The authors declare that they have no competing interests.

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