

Prevalence of gastrointestinal parasitism in free ranging rhesus macaque (*Macaca mulatta*) of Himachal Pradesh

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Abstract

Coprolological examination of 499 free ranging macaques (*Macaca mulatta*) of either sex from Hamirpur district of Himachal Pradesh was carried out to study the prevalence of gastrointestinal parasites. The overall percent prevalence of gastrointestinal parasites was 59.32% and the order of predominance was *Strongyle* spp.(55.42%), *Strongyloides* sp. (17.23%), *Trichuris* sp.(11.52%), *Coccidia* (8.78%) and *Ascaris* sp. (7.43%). No significant differences in infection could be observed between the sexes and age groups during the study.

Introduction

Non human primates (NHPs) are susceptible to almost all types of parasitic diseases, particularly helminthic infections (Panda & Pal, 1996). Information on gastrointestinal protozoan and helminthic infections of NHPs particularly from Indian subcontinent is limited due to paucity of systematic investigations. Studies have demonstrated that NHPs may act as carrier of human gastrointestinal parasites (Karere and Munene, 2002), ectoparasites (Kalema-Zikusoka *et al.*, 2002) and bacteria (Nizeyi *et al.*, 2001). Human population living in close proximity of such animals or the individual working in game parks, animal orphanages or research station may be at risk of acquiring pathogens from infected animals (Mutani *et al.*, 2003). Therefore, the main objective of this study was to study prevalence of the gastrointestinal (GI) parasites in free ranging rhesus monkeys in and around Hamirpur district of Himachal Pradesh.

Materials and Methods

The wild rhesus monkeys brought to Monkey Sterilization Centre, Hamirpur for sterilization were the



Fig. 1. Ova of gastrointestinal parasites from faecal samples of free ranging rhesus macaques; a. *Strongyle* spp., b. *Strongyloides* sp., c. *Trichuris* sp.

subject of the present study. They were brought from different areas of Hamirpur and neighboring districts of Kangra, Bilaspur and Mandi and kept in squeeze cages. Fresh faecal samples from four hundred ninety nine animals were taken from the bottom of each cage and placed in a labeled container. In addition age and sex of each animal was recorded. The collected faecal samples were immediately preserved in 5% formalin and later on, were analyzed by the floatation method using Sheather's (saturated sugar) solution and the identification of parasitic egg was done as described by Soulsby (1982).

Results

Screening of the faecal samples revealed mild to moderate infection of *Strongyle* spp., *Strongyloides* sp., *Trichuris* sp., *Coccidia* and *Ascaris* in monkeys of Himachal Pradesh. During the present investigation, the overall prevalence of gastrointestinal parasitism was 59.32% with almost equal susceptibility of male monkeys (58.33%) and female monkeys (60.32%). The per cent prevalence of gastrointestinal parasitic infection in adult male monkeys for *Strongyle* spp., *Strongyloides* sp., *Ascaris* sp., *Trichuris* sp. and *Coccidia* was 51.20, 19.20, 12.80, 10.40 and 6.40, respectively; whereas in

adult female monkeys the values were 69.09, 10.90, 2.73, 8.18 and 9.09, respectively (Fig 1). Similarly, the percentage of prevalence of gastrointestinal parasitic infection in male juvenile for *Strongyle* spp., *Strongyloides* sp., *Ascaris* sp., *Trichuris* sp. and *Coccidia* was 36.36, 27.27, 4.54, 18.18 and 13.63, respectively; whereas in female juvenile monkeys the values were 41.03, 23.08, 5.13, 17.95 and 12.82%, respectively. The Fig. 1 has represented the egg of some important gastrointestinal parasite obtained from wild rhesus monkeys.

Discussion

It is inferred that wild rhesus monkeys of Himachal Pradesh suffered from gastrointestinal parasitism comprising of *Strongyle*, *Strongyloides*, *Trichuris*, *Coccidia* and *Ascaris* sp. The pattern of gastrointestinal parasitism may vary from place to place depending upon the climatic and geographic conditions. Panda

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Table 1 Prevalence of gastrointestinal parasites of the wild rhesus monkeys (*Macaca mulatta*)

Sex (n)	Age group (n)	No. (%) positive	Gastrointestinal parasites				
			No. (%) infection				
			<i>Strongyle</i>	<i>Strongyloides</i>	<i>Ascaris</i>	<i>Trichuri</i>	<i>Coccidia</i>
Male (n=252)	Adult (208)	125 (60.01)	64 (51.20)	24 (19.20)	16 (12.80)	13 (10.40)	8 (6.40)
	Juvenile (44)	22 (50.00)	8 (36.36)	6 (27.27)	1 (4.54)	4 (18.18)	3 (13.63)
Female (n=247)	Adult (179)	110 (61.45)	76 (69.09)	12 (10.90)	3 (2.73)	9 (8.18)	10 (9.09)
	Juvenile (68)	39 (57.35)	16 (41.03)	9 (23.08)	2 (5.13)	7 (17.95)	5 (12.82)
Overall (n=499)		296 (59.32)	164 (32.87)	51 (10.22)	22 (4.41)	33(6.61)	26(5.21)

and Pal (1996) reported occurrence of *Balantidium coli* (28.30 %), *Entamoeba coli* (49.05 %), *Ancylostoma duodenale* (9.43 %), *Trichuris* (11.32 %) and *Ascaris lumbricoides* (10.06 %) in captive monkeys of West Bengal. Parmar *et al.* (2012) also studied the parasitic infections in non-human primates of Gujarat state and reported the presence of *Strongyloides* spp., *Trichuris* spp., *Entamoeba histolytica* spp., *Ascaris* spp., *Entamoeba coli*, *Spirometra* spp. in the GIT. Mutani *et al.* (2003) reported presence of *Strongyloides*, *Physaloptera*, *Trichuris*, Hookworm, *Oesophagostomum*, *Trichostrongylus* and *Ascaris* in green monkey which is almost similar to these findings. No significant differences in infection rate could be observed between the two sexes and age groups during the study of Panda and Pal (1996) which are almost similar to the findings of this study. Therefore, the findings of this present study substantiated the results of previous works.

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