Indian J. Anim. Sci. 49 (2) : 159–161, February 1979

A note on the prevalence of helminth parasites in wild and zoo animals in Uttar Pradesh

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Received : 23 November 1977

Parasitic infestations cause considerable losses in wildlife in this country. Very little work has been done so far to study the nature and status of the various parasitic diseases commonly encountered in these animals (Ramanujachari and Alwar, 1951; Singh and Pande, 1963; Srivastava and Pande, 1965). A systematic survey was recently undertaken to study the prevalence and distribution of helminth parasites in wild/zoo animals in this State. This work was carried out under a PL-480 scheme entitled, "Reservoirs of zoonotic diseases of Uttar Pradesh". Despite certain limitations, a large number of animals were examined, and the information obtained is presented in this paper.

This survey was mainly confined to the National Jim Corbett Park, Nainital, and the Zoological Park, Kanpur. Faecal samples were collected at random, each sample from a different animal. In the case of deer a set of samples was collected from each area as far as possible. The faecal samples were examined for parasitic eggs by direct smear and the Stoll's egg-counting technique. Measurements of eggs were also taken whenever necessary. Identification of larvae was done in doubtful samples after culture at 26°C for 7 days.

The helminths and their prevalence are shown in Table 1.

Although a number of helminth species were recorded during this survey, infection with the intestinal nematodes was rather low. Of the 211 animals examined, 96 were free of helminths. Except in deer most other infected animals harboured only 1 species of nematode. But this does not necessarily mean that the worm burden of the hosts examined were light. A number of factors such as variability of the moisture content of the faeces and the climatic conditions influence the incidence of infection. The immune response of the host may also sometimes suppress the fecundity of the parasites (Roberts, 1957; Muller, 1961).

The common prevalent species (Table 1) were *H. contortus*, *Oesophagostomum* sp. and strongyles. The occurrence of *T. leonina* and *F. buski* is of considerable zoonotic significance. Considering the prevalence of *H. contortus* and *Oesophagostomum* sp. in wild deer, it appears that these nematodes have adapted well to this host species, and as such the reservoir status of deer for these helminths is of considerable significance. Infections with *F. gigantica* were fairly high and appeared to be a fairly well-established deer parasite. All these parasites were acquired locally. It would, therefore, be of considerable interest to obtain information on the incidence of *F. gigantica* in other wild/zoo animals and ruminants in this area. In any case, the reservoir status of deer for *F. gigantica* appeared to be quite significant because it was an important parasite of livestock in this country.

At present, the information is not available for evaluating the potential of intestinal nematodes and other helminths for causing clinical disease in deer and

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Table 1. Prevalence of helminth infections in wild and zoo animals

Host	No. of animals examined	No. of animals infected	Helminth infection
National Jim Corbett Park			
1. Wild deer (*Axis axis* and *Cervus duvaucelli*)	122	79	*Fasciola gigantica* (13)* Amphistomes (10) *Haemonchus contortus* (24) *Strongyloides papillosus* (12) *Oesophagostomum* sp. (4) Strongyle (16)
Zoological Park, Kanpur			
1. Elephant, Indian (*Elephas maximus*)	8	5	Strongyle (5)
2. Lion, Indian and African (*Panthera leo*)	2	1	*Toxascaris leonina* (1)
3. Tiger (*Panthera tigres*)	3	1	*Toxascaris leonina* (1)
4. Panther (*Panthera pardus*)	1	0	—
5. River hippopotamus (*Hippopotamus amphibius*)	1	1	Strongyle (1)
6. Bear (*Ursus americanus*)	2	0	—
7. Zebra (*Equus burchelli*)	2	0	—
8. Wild boar (*Sus scrofa*)	10	7	*Oesophagostomum* sp. (5) *Ascaris suum* and *Fasciolopsis buski* (2)
9. Rhinoceros (*Rhinoceros unicornis*)	2	0	—
10. Deer (spotted, Thamin, white, sika) (*Axis axis, Odocoileus virginianus*)	11	6	Strongyle (5) *Bunostomum* sp. (1)
11. Horned antelope (*Antilope cervicapra*)	4	0	—
12. Giraffe (*Giraffa camelopardalis*)	1	0	—
13. Red panda (*Ailurus fulgens*)	4	2	Strongyle (2) Amphistomes (1)
14. Giant panda (*Ailuropoda melanoleuca*)	1	0	—
15. Leopard cat (*Prionailurus bengalensis*)	2	1	*Ancylostoma* sp. (1)
16. Toddy cat (*Paradoxurus hemaphroditus*)	3	1	*Ancylostoma* sp. (1)
17. Wild cat (*Felis chaus*)	1	0	—
18. Ocelot (*Felis pardalis*)	1	0	—
19. Fox (Indian, yellow-throated marten) (*Vulpes bengalensis and Vulpes fulva*)	3	0	—
20. Striped hyena (*Hyaena hyaena*)	1	0	—
21. Black buck, Indian antelope (*Antilope cervicapra*)	4	3	Strongyle (2) *Haemonchus contortus* (1)
22. Indian Gazelle (*Gazella bennetti*)	1	0	—
23. Blue bull (*Boselaphus tragocamelus*)	1	0	—
24. Sambar (*Rusa unicolor*)	3	0	—
25. Binturong (*Arctictis binturong*)	2	1	Strongyle (1)
26. Chimpanzee (*Pongopygamaeus pygmaeus*)	2	0	—
27. Baboons (*Papio papio and P. anubis*)	4	2	*Ascaris* sp. (1) *Trichuris* sp. (1)
28. Langur (*Presbytis johni*)	3	1	*Ancylostoma* sp. (1)
29. Rhesus monkey (*Macaca mulatta*)	4	2	*Ascaris* sp. (1) *Ancylostoma* sp. (1)
30. Chinchilla (*Chinchilla laniger*)	1	1	Strongyle (1)
31. Python (*Python molurus*)	1	1	Strongyle (1)

*Figures in parentheses indicate the number of animals infected.

other host animals. Some of the animals examined during this survey also showed clinical signs of parasitism such as severe weakness, diarrhoea and dehydration. Studies on helminth parasitism in white deer in America showed that *Strongyloides* sp. and other nematodes could cause considerable mortality in this host species (Prestwood *et al.*, 1976). Our observations showed an apparent significance of helminthiasis in wildlife in the areas examined. It further indicated the need for a much extensive survey in different localities involving large number of animals on a seasonal basis so as to understand the implications of parasitism in wildlife.

ACKNOWLEDGEMENTS

The authors thank the Warden, National Jim Corbett Park, and the Director, Zoological Park, Kanpur, for their co-operation in carrying out these investigations. They also thank Dr A. K. Tripathi, Veterinary Officer, Zoological Park, and Dr M. P. Yadav, S. R. O. (Virology), for their help in the collection of the samples.

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Indian J. Anim. Sci. **49** (2) : 161–163, February 1979

A note on the identity of *Haemonchus bispinosus* and *H. contortus* based on genetical development

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Received : 10 February 1978

On the basis of limited experiments conducted at the Indian Veterinary Research Institute, Izatnagar, to establish pure infection of *Haemonchus bispinosus* and *H. contortus*, it was suggested to carry out further research to elucidate whether these two species are genetically different. It was, therefore, proposed to carry out the present investigation.

A large number of worms belonging to genus *Haemonchus* were collected from sheep and goats from local slaughterhouse

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