# GASTROINTESTINAL PARASITES IN TWO TROOPS OF WILD *MACACA SINICA* IN THE UNIVERSITY OF PERADENIYA PREMISES

**Ironie I. Nagasena[1], R. P. V. J. Rajapakse[2] and Suyama Meegaskumbura[1]***

*[1]Department of Zoology, Faculty of Science, University of Peradeniya*
*[2]Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya*

## Introduction

Gastrointestinal parasites of primates have an impact on both primate conservation and human health. Due to the close phylogenetic relationship between human and nonhuman primates, high potential of transmission of parasites between these two groups is expected (Wolfe *et al.*, 1998). Further, the continuously increasing human population density causes reduction and fragmentation of primate habitats. With this and other anthropogenic activities, human-primate contact increases leading to higher rates of pathogen transmission.

Many studies have documented gastrointestinal parasites of wild and captive primates around the world. In Sri Lanka, two such investigations on *Macaca sinica* (Toque monkey) from a Nature Sanctuary and Archeological Reserve in Polonnaruwa reported number of helminth and protozoan parasites. Of the above studies, Dewit *et al.* (1991) reported six helminth taxa (*Oesophagostomum* sp., *Strongyloides* sp., *Trichostrongylus* sp., *Hymenolepis* sp., *Streptopharagus* sp., *Trichuris* sp.) while Ekanayake *et al.* (2006) reported five types of helminth eggs and eight protozoan parasites (*Enterobius* spp., Spiruroid type eggs, *Strongyloides* sp., Strongyle type eggs, *Trichuris* sp., *Entamoeba coli*, *Entamoeba histolytica / Entamoeba dispar*, *Cryptosporidium* spp., *Iodamoeba* spp., *Entamoeba hartmanni*, *Chilomastix* spp., *Balantidium coli*). Another study carried out in Kandy recorded four helminth and four protozoan parasites; Round worm, Whipworm, hookworm, *Strongyloides stercoralis*, *Entamoeba coli*, *Entamoeba histolytica*, *Blastocystis hominis* and *Giardia intestinalis* (Wijesundera *et al.*, 1999).

In the present study, two troops of *M. sinica* from the University of Peradeniya premises were investigated for gastrointestinal parasites. The objectives of the study were to identify the parasites in *M. sinica*, to determine the prevalence of each parasite taxon and to investigate the gender difference in infections.

## Materials and Methods

Two troops of *M. sinica*, with home ranges extending from the campus to the Hantana forest were selected. The two troops did not overlap in their home ranges. However, both troops were found foraging on human refuse in garbage pits and bins as well as in the forest. Fresh faecal samples were collected from identified individuals and the parasites and their developing stages were extracted from samples

using formalin-ether concentration technique. Sediments obtained from the above technique and direct smears stained with Harris Haematoxalin & Eosin were observed under the microscope for identification.

## Results

Five types of helminth eggs (*Strongyle* type eggs, *Trichuris* sp., *Capillaria* sp., *Ascaris* sp. and *Strongyloides* sp.) and a protozoan parasite (*Entamoeba histolytica / Entamoeba dispar*) were recovered in the study (Figures 1 and 2, respectively).

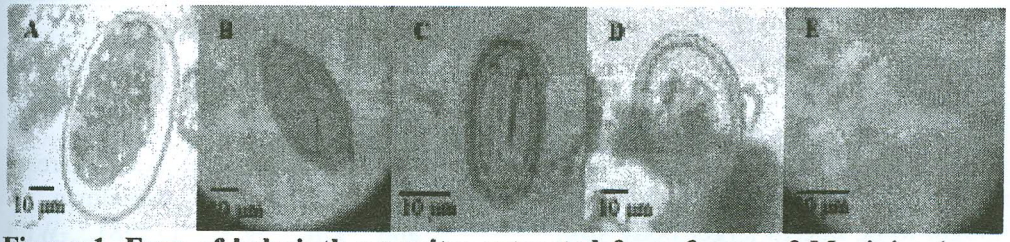


**Figure 1. Eggs of helminth parasites extracted from faeces of *M. sinica* (mean length/ width in µm): (A) *Strongyle* type egg (76 /42.75), (B) *Trichuris* sp. (47.5/38), (C) *Capillaria* sp. (43.2/26.4), (D) *Ascaris* sp. (50.4/36) and (E) *Strongyloides* sp. (47.5/23.75).**

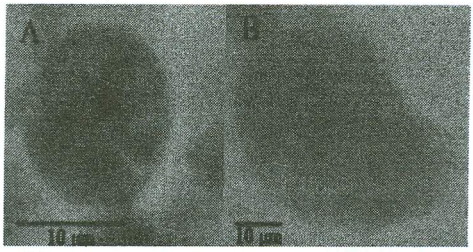


**Figure 2. *Entamoeba histolytica / E. dispar* recorded from *M. sinica* (mean length/ width in µm): (A) Cysts (10/15) and (B) Trophozoite (35.5/ 61.6).**

Of all the sampled individuals, 31.25% (10/32) and 25% (8/32) were infected with helminth parasites and the protozoan parasite (*E. histolytica / E. dispar*), respectively. Of the infected individuals, most prevalent was *Strongyle* type eggs (90%). *Trichuris* sp. (40%), *Capillaria* sp. (30%), *Ascaris* sp. (20%) and *Strongyloides* sp. (10%) were less prevalent. Of the nine individuals excreting *Strongyle* type eggs, five were shedding only *Strongyle* type eggs, while the rest had mixed infections with one or more of the other helminths. One individual was infected only with *Trichuris* sp.

There was a gender difference in parasite infections. Prevalence of parasitic infections was higher in males compared to females. Out of 23 samples from males, 8 (34.78%) were infected and out of 9 samples from

females, 2 (22.22%) were infected ($p < 0.05$). Mix infections were recorded only from males while the infected females had only *Strongyle* type eggs.

## Discussion

About one third and one fourth of the individuals of *M. sinica* were infected with helminth and protozoan parasites, respectively. *Capillaria* sp. is a new record for *M. sinica* in Sri Lanka. The study also showed that males are more prone to gastrointestinal parasite infections than females, which is consistent with other similar studies. The higher prevalence of parasites in males is thought to be due to larger body size, higher exposure to parasites and immunosuppressive effects of testosterone. This knowledge on gastrointestinal parasites can be used in conservation effort of *M. sinica* as well as to evaluate the impact on human health due to zoonotic infections.

## References

Dewit, I., Dittus, W.P.J., Vercruysse, J., Harris, E.A. and Gibson, D.I. (1991). Gastrointestinal helminths in a natural population of *Macaca sinica* and *Presbytis* spp. at Polonnaruwa, Sri Lanka. *Primates*, 32(3): 391-395.

Ekanayake, D.K., Arulkanthan, A., Horadagoda, N.U., Sanjeevani, G.K.M., Kieft, R. and Dittus, W.P.J. (2006). Prevalence of Cryptosporidum and other enteric parasites among wild non-human primates in Polonnaruwa, Sri Lanka. American Journal of Tropical Medicine and Hygiene, 74(2): 322-329.

Wolfe, N.D., Escalante, A.A., Karesh, W.B., Kilbourn, A., Spielman, A. and Lal, A.A. (1998). Wild primate populations in emerging infectious diseases. Disease research the missing link? Emerging Infectious Diseases, 4(2): 149-158.

Wijesundera, M. de S., Edirisinghe, J.S. and Weilgama, D.S. (1999). p. 35. In: Proceedings of the 21st Annual Academic Sessions of Kandy Society of Medicine.