

# Infections of Gastrointestinal Parasites in Mammals from Chiang Mai Zoo

Kasitdet Chailamphun and Preeyaporn Butboonchoo

Zoology Program, Faculty of Science, Chiang Mai University, Chiang Mai, 560200, Thailand

E-mail address : Kasitdet\_c@cmu.ac.th



FACULTY OF SCIENCE  
CHIANG MAI UNIVERSITY



## ABSTRACT

Mammals are the definitive hosts of various gastrointestinal parasites. In Chiang Zoo, various mammals are kept and released into the wild. They can be infected with parasites from food and environment. This study aimed to investigate the prevalence and intensity of gastrointestinal parasites in mammals from Chiang Mai Zoo. Thirty-three mammals (15 artiodactyls, 3 primates, 15 carnivores) were detected for parasitic infections by fecal examination using a simple direct smear and formalin-ether concentration technique. Only helminth was found from the simple direct smear technique, with an overall prevalence of 18.18%. The prevalence in each mammal group was 20% in artiodactyls, 20% in carnivores, and not found in primates. The helminths were identified as rhabditiform larvae and eggs of *Strongyloides* sp. with prevalences of 3.03% and 15.15%, respectively, and intensities of 47.50 and 3.67, respectively. Both helminths and protozoa were found from the formalin-ether concentration technique, with an overall prevalence was 21.21%. The prevalence in each mammal group was 26.66% in artiodactyls, 20% in carnivores, and not found in primates. The parasites were identified as rhabditiform larvae and eggs of *Strongyloides* sp., and cysts of *Entamoeba* sp., with prevalences of 6.06%, 21.21%, and 3.03%, respectively, and intensities of 30, 2.43, and 34, respectively. This study shows the presence of gastrointestinal parasite infections that can be transmitted to other animal species and humans, suggesting the need for future measures to manage the spread.

## INTRODUCTION

Mammals in diverse habitats are prone to parasite infections, especially through diet and environment. Zoos like Chiang Mai Zoo, while simulating natural habitats, still expose animals to parasites from contaminated food and surroundings. Common parasites like roundworms, flukes, and protozoa can harm mammal health and spread to other animals and humans.

Parasitic infections are a concern for zoo mammals in Asia, as evidenced by studies in Thailand (Sangpeng et al., 2023) and Nepal (Dhakal et al., 2022), which have identified protozoa, flukes and nematodes as common parasites.

Therefore, this study aims to investigate prevalence and intensity in Chiang Mai Zoo mammals, classify gastrointestinal parasites, and develop prevention strategies for animals and humans, as no prior research exists there.

## MATERIALS AND METHOD



Artiodactyla = 15 samples



Mammals = 3 samples



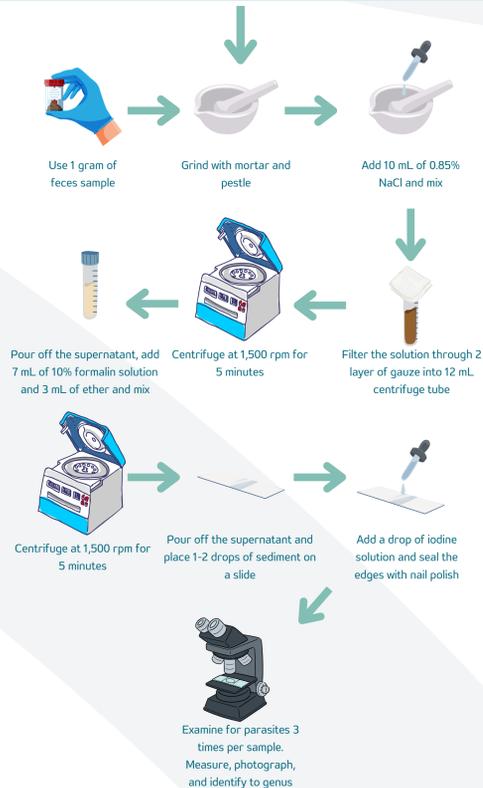
Carnivora = 15 samples

Fresh feces sample were collected from 3 orders of mammals in Chiang Mai Zoo (n=33)

### Simple Direct Smear

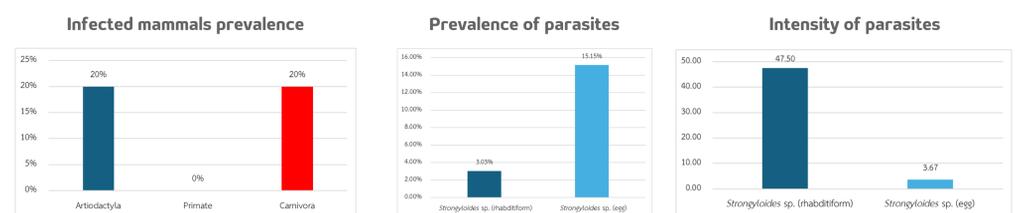


### Formalin - Ether Concentration Technique

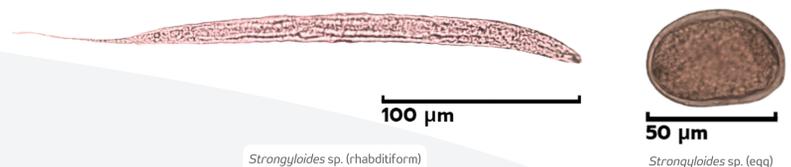


## RESULTS

Thirty three mammal fecal samples were examined using simple direct smear method, parasites were found in 6 samples (18.18%), with prevalence of 20% in artiodactyls and carnivores, and no parasites detected in primates, identifying *Strongyloides* sp. rhabditiform larvae and eggs with prevalences of 15.15% and 3.03% respectively, and intensity of 3.67 and 47.50 respectively (Figures 1 and 2)

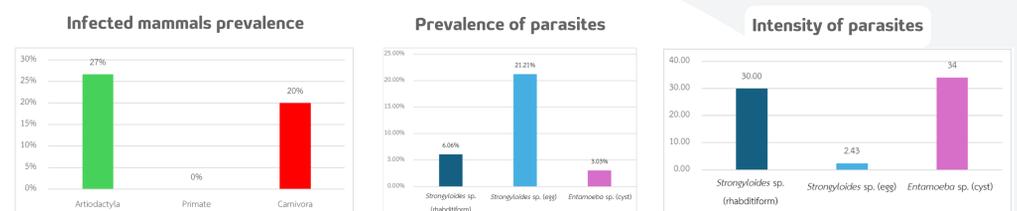


Figures 1 : Prevalence and intensity of gastrointestinal parasites in mammals using simple direct smear method



Figures 2 : Identified gastrointestinal parasites in mammals using simple direct smear method

Thirty three mammal fecal samples were examined using formalin-ether concentration technique, parasites were found in 7 samples (21.21% prevalence), with prevalence of 26.66% in artiodactyls and 20% in carnivores, and no parasites detected in primates, identifying *Strongyloides* sp. rhabditiform larvae, eggs and *Entamoeba* sp. cysts with prevalences of 6.06%, 21.21% and 3.03% respectively, and intensity of 30, 2.43 and 34 respectively (Figures 3 and 4)



Figures 3 : Prevalence and intensity of gastrointestinal parasites in mammals using formalin-ether concentration technique



Figures 4 : Identified gastrointestinal parasites in mammals using formalin-ether concentration technique

## ACKNOWLEDGMENTS

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Dhakal, P., Sharma, H. P., Shah, R., Thapa, P. J., & Pokheral, C. P. (2023). Copromicroscopic study of gastrointestinal parasites in captive mammals at Central Zoo, Lalitpur, Nepal. *Veterinary Medicine and Science*, 9, 457-464

<https://www.facebook.com/FanpageChiangMaiZoo/>

## Conclusion

Simple direct smear showed 18.18% overall prevalence, detecting *Strongyloides* sp. rhabditiform larvae and eggs mainly in artiodactyls and carnivores (20% each). Formalin-ether concentration technique showed slightly higher overall prevalence (21.21%), identifying *Entamoeba* sp. cysts and more *Strongyloides* sp. eggs and rhabditiform larvae and artiodactyl prevalence was higher (26.66%). Primates were parasite-free with both methods. Direct smear showed higher *Strongyloides* sp. larvae intensity, while formalin-ether concentration showed higher *Entamoeba* sp. cyst intensity.