
**UNIVERSITI PUTRA MALAYSIA**

# *PREVALENCE OF GASTROINTESTINAL PARASITES IN CAPTIVE BOVIDAE AT ZOO NEGARA*

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# PREVALENCE OF GASTROINTESTINAL PARASITES IN CAPTIVE BOVIDAE AT ZOO NEGARA

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A project paper submitted to the
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# CERTIFICATION

It is hereby certified that we have read this project paper entitled "Prevalence Of Gastrointestinal Parasites In Captive Bovidae At Zoo Negara", by Kasturi A/P Nadarajah and in our opinion it is satisfactory in terms of scope, quality, and presentation as partial fulfillment of the requirement for the course VPD 4999 – Project

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# DEDICATIONS

This project paper is dedicated to my support circle that had constructively made it possible for me to work towards developing my competence to serve the field of veterinary medicine

To my family,
Father Mother
Brother,
Aunties and
my extended
family and
friends

And to all my teachers who have both inspired me and driven me while providing the educational opportunity through careful facilitation and guidance

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Indeed this has been a fulfilling experience in which I had a wonderful educational experience and learn to be competent in terms of researching.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| % | Percent |
| g | Gram |
| ml | Milliliter |

**ABSTRACT**

Abstract of the project paper presented to the Faculty of Veterinary Medicine in partial requirement for the course VPD 4999 - Project

# PREVALENCE OF GASTROINTESTINAL PARASITES IN CAPTIVE BOVIDAE AT ZOO NEGARA

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**2016**

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**Dr Mark Hiew Wen Han**

Parasitic diseases constitute one of the major problems causing mortality in captive Bovidae. Thus a study on the prevalence of gastrointestinal parasites was investigated from various species of animals from the Bovidae family housed at Zoo Negara Malaysia. A total of 14 pooled fecal samples were collected randomly from 8 species from 5 genus which are *Bos* (6), *Hippotraginae* (2), *Tragelaphus* (2), *Oryx* (2), and *Kobus* (2). All samples were examined by direct wet mount preparation, formalin ethyl acetate concentration technique and permanent stains which are trichriome and giemsa. Intestinal parasites that were found in all species were *Strongylids* (21.4%), *Moniezia sp. (*14.9%), *Capillaria sp.* (7.1%),

*Cryptosporidium spp.* (7.1%) and *Entamoeba sp.* (7.1%). All samples that were positive for helminths or protozoa were asymptomatic animals with low parasitic loads. Monitoring the gastrointestinal parasite of wild Bovidae in captivity is imperative in assisting zoo management in the formulation and implementation of preventive and control measures against the spread of infectious parasitic diseases among these animals within the zoo or to humans.

Keyword: Gastrointestinal parasite, Bovidae, formalin ethyl acetate concentration, helminths, protozoa

ABSTRAK

Abstrak daripada kertas projek yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan kursus VPD 4999 – Projek

**KELAZIMAN PARASIT GASTROUSUS DI DALAM BOVIDAE TAWANAN DI ZOO NEGARA**

**Oleh**

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Penyakit parasit merupakan salah satu masalah paling besar yang menyebabkan kematian di kalangan haiwan keluarga bovidae dalam kurungan. Oleh itu, satu kajian berkenaan kelaziman parasit-parasit gastrousus telah dijalankan ke atas pelbagai spesies haiwan daripada keluarga Bovidae yang terdapat di Zoo Negara. Sebanyak 14 sampel tinja dikumpulkan secara rawak daripada 8 spesies dari 5 genus iaitu *Bos* (6), *Hippotraginae* (2), *Tragelaphus* (2), *Oryx* (2), dan *Kobus* (2). Semua sampel telah dikaji menggunakan kaedah penyediaan pelekap basah secara langsung, teknik kepekatan formalin etil asitat dan pewarna kekal iaitu trichriome dan giemsa. Parasit usus yang dijumpai di dalam semua

spesies adalah *Strongylids* (21.4%), *Moniezia sp. (*14.9%), *Capillaria sp.* (7.1%), *Cryptosporidium spp.* (7.1%) dan *Entamoeba sp.* (7.1%). Semua sampel yang didapati positif bagi helmin atau protozoa adalah haiwan asimptomatik dengan beban parasit yang rendah. Penyeliaan parasit bagi Bovidae liar adalah mustahak dalam tugas membantu pengurusan zoo di mana pengubalan dan pelaksanaan tindakan pencegahan dan kawalan penyebaran penyakit berjangkit parasit di kalangan haiwan di zoo ataupun ke atas manusia.

Kata-kata kunci : parasit gastrousus, bovidae, helmin,protozoa

# 1.0 INTRODUCTION

## 1.1 Gastrointestinal Parasitism in captive bovidae

Zoological gardens in Malaysia exhibit wild animals from Bovidae Family for aesthetic, conservation and educational purpose. However, parasitic diseases constitute one of the major problems causing even mortality in these animals while in captivity.(Varadharajan & Pythal, 1999) Unfortunately, there has been few detailed and comprehensive studies on the prevalence of the intestinal parasites in animals housed in zoological garden. Some studies have reported on the incidence of intestinal parasitic infections in hoofed animals in one particular zoological garden in Malaysia. (Lim *et al* , 2008)

However it was a pooled sampled from the hoofed aniamals. Inadequate information on diseases and parasites of zoo animals is a major limiting factor at zoological garden (Opara & Fagbemi, 2016). Therefore, this study pioneers examining and documenting the gastrointestinal parasites profile among Bovidae Family kept in Zoo Negara and for better understanding of the gastrointestinal parasite fauna of these animals and management of the animal's health by preventing spread of infectious parasitic diseases among the herd, within the zoo or humans.

Hence, this study was undertaken to fulfill the objective of to determine the gastrointestinal parasite population in Captive Animals of the Bovidae Family at Zoo Negara

For this research, the following hypothesis was proposed:

I. The population of gastrointestinal parasites in the family of Bovidae at Zoo Negara differs according to species.

## REFERENCES

Geraghty, V., Mooney, J., Pike, K., (1982). A study of parasitic infections in mammals and birds at the Dublin Zoological Garden. Vet. Res. Commun. 5, 343–348.

Khatun, M. M., & Begum, N. (2014). Coprological study of gastrointestinal parasites of captive animals at Rangpur Recreational Garden and Zoo in Bangladesh, 6(July), 6142–6147.

Lefevre, P. C. (2010). Infectious and parasitic diseases of livestock. Paris, France: Editions Tec & Doc.

Lim, Y. A. L., Ngui, R., Shukri, J., Rohela, M., & Mat Naim, H. R. (2008). Intestinal parasites in various animals at a zoo in Malaysia. Veterinary Parasitology, 157(1-2), 154–159. http://doi.org/10.1016/j.vetpar.2008.07.015

Mooney, J. (2016). A study of parasitic infections in mammals and birds at the Dublin Zoological Gardens, (March). http://doi.org/10.1007/BF02215003

Muoria, P. (2006). Cross - sectional survey of gastro - intestinal parasites of Grevy ' s zebras in southern Samburu , Kenya, (March 2016). http://doi.org/10.1111/j.1365-2028.2005.00588.x

Opara, M. N., & Fagbemi, B. O. (2016). Occurrence and prevalence of gastrointestinal helminthes in the wild grasscutter ( Thryonomys swinderianus , Temminck ) from Southeast Nigeria from Southeast Nigeria, (March).

Soulsby, E.J.L. (1982). Helminthes, Arthropodes and Bichitra Gopal Nath and Apurba Chakraborty Protozoa of Domesticated animals. 7th ed. ELBS, designed the study as this was a part of Bichitra Gopal Bailliere Tindall

Suarez, V., Cristel, S., & Busetti, M. (2009). Epidemiology and effects of gastrointestinal nematode infection on milk productions of dairy ewes. Parasite, 16(2), 141-147.

Varadharajan, A., & Pythal, C. (1999). Parasites of wildlife - i a preliminary investigation on the parasites of wild animals at the zoological garden , thiruvananthapuram , i(February), 159–164.