

Prevalence of Blood Protozoa in Duck at Hakaluki and Tanguar Haor of Sylhet Division in Bangladesh



Azizul Hoque

Roll No. 0117/02

Registration No. 364

**A thesis submitted in the partial fulfillment of the requirements for the degree
of Master of Science in Parasitology.**

**Department of Pathology and Parasitology
Faculty of Veterinary Medicine
Chittagong Veterinary and Animal Sciences University
Chittagong-4225, Bangladesh.**

JUNE 2018

AUTHORIZATION

I hereby declare that I am the sole author of the thesis. I authorize the Chittagong Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize the CVASU to reproduce the thesis by photocopying or by other means, in total or in part, at the request of others institutions or individuals for the purpose of scholarly research.

I undersigned, and author of this work, declare that the electronic copy of this thesis provided to the CVASU Library, is an accurate copy of the print thesis submitted, within the limit of technology available.

(Azizul Hoque)

Prevalence of Blood Protozoa in Duck at Hakaluki and Tanguar Haor of Sylhet Division in Bangladesh

Azizul Hoque

Roll No. 0117/02

Registration No. 364

This is to certify that we have examined this thesis and have found that it is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made.

.....
(Prof. Dr. Mohammad Alamgir Hossain)
Supervisor

.....
(DR. Tofazzal Md. Rakib)
Co-Supervisor

.....
(Prof. Dr. Mohammad Alamgir Hossain)
Chairman of the Examination Committee
Department of Pathology and Parasitology
Faculty of Veterinary Medicine

Chittagong Veterinary and Animal Sciences University
Chittagong-4225, Bangladesh.

JUNE 2018

DEDICATION

***To my parents and teachers
who always valued education
above everything else.***

Acknowledgements

I wish to acknowledge the immeasurable grace and profound kindness of Almighty “Allah” the supreme authority and supreme ruler of universe, who empowers the author to complete the work successfully.

I feel proud in expressing my deep sense of great gratitude and indebtedness to respected teacher and supervisor Professor Dr. Mohammad Alamgir Hossain, Department of Pathology and Parasitology, Chittagong Veterinary and Animal Sciences University for his trustworthy and scholastic supervision.

I am also grateful to my Co-Supervisor, DR. Tofazzal Md. Rakib, Lecturer, Department of Pathology and Parasitology, CVASU, for his encouragement, cooperation and full technical support in this research.

I am also grateful to Professor Dr. Md. Masduzzaman, Professor Dr. AMAM Zonaed Siddiki, Professor Dr. Sharmin Chowdhury, Professor Dr. Tania Ferdushy, Professor Dr. Krisna Roy, Associate Professor Dr. Abdul Alim, Associate Professor Dr. Shubhagata Das and all other teachers at DPP, CVASU for their valuable supervision and suggestion.

I would like to thank Professor Dr. Md. Masduzzaman, Principal Investigator, PIU-BARC, NATPPhase-II (CRG No.448) for funding my research work.

Sincere thanks to the University Grand Commission (UGC) of Bangladesh for the financial support through the HEQEP project (CPSF-2180).

I would like to thank Dr. Shemol Chandra Podder, ULO, Mirsharai, Chittagong for his encouragement and supporting.

I also like to thank Dr. Amir Hossain, VS, Sandip, Chittagong for his cordial supporting.

The Author

JUNE 2018

Table of Contents

Contents	Page no.
Authorization.....	ii
Acknowledgments.....	v
Table of Contents.....	vi-vii
List of Tables.....	viii
List of Figures.....	ix
List of Abbreviations.....	x
Summary.....	xi-xii
Chapter 1: Introduction.....	1-2
Chapter 2: Review of Literature.....	3-21
2.1 History of blood protozoa.....	3-4
2.2 Morphology of Blood Protozoa.....	4-11
2.3 Life Cycle of Blood Protozoa.....	11-14
2.4 Transmission of Blood protozoa.....	14-17
2.5 Public Health Significance.....	17-18
2.6 Diagnosis of Blood protozoa.....	18-21
Chapter 3: Materials and Methods.....	22-28
3.1 Study area and duration of study.....	22
3.2 Sampling strategy.....	22-23
3.3 Sample collection.....	23
3.4 Ante-mortem examination.....	24
3.5 Preparation of blood smears and identification of protozoa.....	24
3.6 Statistical analysis.....	24

Chapter 4: Results.....	29-37
4.1 Overall Prevalence and Intensity of Infection.....	29
4.2 Prevalence according to breeds	29
4.3 Prevalence according to sex.....	30
4.4 Prevalence according to age.....	30
4.5 Prevalence according to vaccination status.....	30
4.6 Prevalence according to deworming status.....	30
4.7 Prevalence according to health status.....	30
4.8 Prevalence according to scavenging system.....	31
4.9 Prevalence according to Housing system	31
Chapter-5: Discussion.....	38-40
Chapter-6: Conclusion.....	41
Chapter-7: References.....	42-51
Biography of the student.....	52

List of Table

Table	Title	Page no.
Table 1	Prevalence of blood protozoa according to age	32
Table 2	Prevalence of blood protozoa according to deworming status	34
Table 3	Prevalence of blood protozoa according to scavenging system	35
Table 4	Prevalence of blood protozoa according to housing system	36

List of Figures

Figure	Title	Page number
Figure 1	Macrogametocyte of <i>H. nettionis</i>	9
Figure 2	Trophozoite of <i>P. relictum</i>	10
Figure 3	Macrogametocyte of <i>Leucocytozoon sp.</i>	11
Figure 4	Life cycle of <i>Plasmodium Sp.</i> (Soulsby, 1982)	12
Figure 5	Life Cycle of <i>Leucocytozoon simondi.</i> (Soulsby, 1982)	13
Figure 6	Life cycle of <i>Haemoproteus sp</i> (Soulsby, 1982)	13
Figure 7	Sample selection strategy from village of sampling area	22
Figure 8	Sampling strategy of duck from sampling area	23
Figure 9	Study area of Hakaluki and Tanguar Haor at a glance	25
Figure 10	Sampling sites of Hakaluki Haor	26
Figure 11	Sampling sites of Tanguar Haor	26
Figure 12	Duck of Haor Areas, Sylhet Division	27
Figure 13	Collection of blood from tarsal vein	28
Figure 14	Preparation of blood smear and fixing the smear	28
Figure 15	Staining of smear and air drying	28
Figure 16	Observation under microscope with 100X by using emersion oil	28
Figure 17	Overall prevalence of blood protozoa in between summer and rainy season	31
Figure 18	Prevalence of blood protozoa among breeds	32
Figure 19	Prevalence of blood protozoa according to sex	33
Figure 20	Prevalence of blood protozoa according to vaccination status	34
Figure 21	Prevalence of blood protozoa according to health status	35
Figure 22	Gametocyte of <i>Haemoproteus sp</i>	37
Figure 23	Gametocyte of <i>Plasmodium sp</i>	37
Figure 24	Gametocyte of <i>Leucocytozoan sp</i>	37

List of Abbreviation

KK	Khaki Campbell
DPD	Deshi Pati Duck
USA	United States of America
WHO	World Health Organization
RBC	Red Blood Cell
CVASU	Chittagong Veterinary and Animal Sciences University
DPP	Department of Pathology and Parasitology
DGI	Double Gametocyte infection
TGI	Triple Gametocyte infection
MGI	Multiple Gametocyte infection
EDTA	Ethylene Diamine Tetra Acetic acid
≤	Less than equal
≥	Greater than equal
M	male
F	female
%	percent
<i>spp.</i>	species
DLS	Department of Livestock Services