شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

بالرسالة صفحات
لم ترد بالأصل

Cairo University

Faculty of Veterinary Medicine

Department of Clinical Pathology

Clinicopathological Studies on the Use of the Medicinal Plant "*Balanites aegyptiaca* Del." (Desert date) Extract for Treatment of *Haemonchus contortus* Infection Experimentally Induced in Small Ruminants

A thesis submitted by

Ezatullah Jaheed

(DVM, Kabul University, Kabul, Afghanistan, 1979; M V Sc, University of Agricultural Sciences, Bangalore, India, 1987)

For the Degree of Ph. D

(Clinical Pathology)

Under supervision of

Dr. Amira H. Mohamed
Prof. of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University.

Dr. Khaled M. A. Mahran
Ass. Prof. of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University.

Dr. Hala A. A. Abou-Zeina
Prof. of Animal Diseases, National Research Centre, Cairo, Egypt.

2020

Cairo University
Faculty of Veterinary Medicine
Department of Clinical Pathology

APPROVAL SHEET

This is to approve the dissertation presented by **Ezatullah Sayed Omar Jaheed** to Cairo University for the degree of Ph.D of Veterinary Medical Sciences (Clinical Pathology) in 15/04/2020 by the examining committee:

Prof. Dr. Mahmoud Badawy Elbegawy

Professor of Pathology
Faculty of Veterinary Medicine
Beni Suif University

Prof. Dr. Nashwa Adel Abu-Aita

Professor of Clinical Pathology
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Amira Hassan Mohamed

Professor of Clinical Pathology
Faculty of Veterinary Medicine
Cairo University (Supervisor)

Cairo University

Faculty of Veterinary Medicine

Department of Clinical Pathology

Supervision Sheet

Dr. Amira H. Mohamed

Professor of Clinical Pathology

Faculty of Veterinary Medicine

Cairo University.

Dr. Khaled M. A. Mahran

Ass. Prof. of Clinical Pathology,

Faculty of Veterinary Medicine,

Cairo University.

Dr. Hala A. A. Abou-Zeina

Prof. of Animal Diseases,

National Research Centre,

Cairo, Egypt.

Cairo University

Faculty of Veterinary Medicine

Department of Clinical Pathology

Name: Ezatullah Jaheed

Date of birth: 10/04/1957

Nationality: Afghan

Degree: Ph.D. in Veterinary Medicine (Clinical Pathology)

Title of Thesis: Clinicopathological Studies on the Use of the Medicinal Plant "*Balanites aegyptiaca* Del." (Desert date) Extract for Treatment of *Haemonchus contortus* Infection Experimentally Induced in Small Ruminants.

Supervisors:

Dr. Amira H. Mohamed, Professor of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University.

Dr. Khaled M. A. Mahran, Ass. Prof. of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University.

Dr. Hala A. A. Abou-Zeina, Professor of Animal Diseases, National Research Centre, Cairo, Egypt.

ABSTRACT

One of the main aggressors is the abomasal nematode, *Haemonchus contortus* (*H. contortus*), which causes haemonchosis in sheep, goat and cattle. Most small ruminants are afflicted by this hematophagous, abomasal parasite and is being a major health concern in small ruminant farms in tropical and subtropical areas around the world. Herein, the curative effect of the medicinal plant *B. aegyptiaca* fruit's (desert date) ethanolic extract (BAF-EE) in comparison with the effects of a common commercial anthelmintic drug, albendazole, was evaluated on haemonchosis experimentally induced in goats. Twelve male, apparently healthy, 6 – 9 months old, Egyptian Baladi goats, weighting 15 – 20 Kg were used. The goats were randomly divided into four equal groups as: G1 (infected-untreated), G2 (infected-BAF-EE treated), G3 (infected-albendazole treated), and G4 (uninfected-BAF-EE treated). Goats of G1, G2 and G3 were infected orally, each with 10,000 3rd stage infective larvae (L_3) of *H. contortus* on zero experimental day. Goats of G1 were left untreated, while goats of G2 and G4 received a single oral dose of BAF-EE at the rate of 9g/Kg BW and goats of G3 were treated with a single oral dose of albendazole at the rate of 5mg/Kg BW on the 5th week post infection (PI), respectively. Hematological, serum biochemical, parasitological, pathological and tissues oxidant-antioxidant status of the experimental animals and phytochemical analysis of the BAF-EE were studied. Phytochemical study of the crude BAF-EE confirmed the presence of antioxidants and anti-parasitic compounds in the plant. Infected goats developed acute form of haemonchosis which was manifested mainly by anemia, thriftless and loss of appetite. Infection was associated with various degrees of alterations in hematological, biochemical and oxidative stress parameters of goats. Level of glutathione peroxidase (GPx) and malondialdehyde (MDA) in the tissues of abomasum and liver was also affected by infection. Pathological events recorded in the abomasum were presence of blood tinged contents, edema and congestion of the abomasal mucosa, enlarged gastric lymph nodes and petechial hemorrhages in all infected goats. Congestion, focal necrosis, fibrinous and petty abscesses were the prominent changes seen in the liver. Histopathologically, the abomasal tissues of infected goats revealed inflammation, edema, necrosis and cellular infiltration while liver showed bile duct hyperplasia, portal fibrosis and portal mononuclear cells infiltration and necrosis of hepatocytes. The severity of lesions was more pronounced in G1 goats than the other groups of animals. After treatment with BAF-EE and albendazole, the altered parameters in G2 and G3 goats were normalized gradually. G4 goats did not demonstrate any behavioral changes and/or toxicity condition throughout the experimental period which lasted for 9 weeks.

Keywords: Haemonchosis, goats, experimental infection, *Balanites aegyptiaca*, anthelmintic activity, hemogram, serum biochemical profile, oxidant-antioxidant, pathology.

Dedication

Dedicated to My Beloved Family Who Encouraged, Supported and Prayed for Me to Overcome this Hard Work

ACKNOWLEDGEMENTS

I thank Allah almighty for giving me an opportunity to be a part of this prestigious University. I started my journey from 2016 - 20, a new life for me. I feel this is a significant, very much memorable pleasant moment and great opportunity to be here in this campus for the last years that has given so many things, made me to reach this stage, new life and most valuable persons in my life. It is a pleasant task to express my regards with immense pleasure to all those who contributed in many ways to my success and made it an unforgettable experience for me.

Indeed the words are not sufficient to pay my sincere regards with immense pleasure and deep sense of gratitude to my honorable Chief Supervisor, Guide and Chairman of Advisory Committee Dr. Amira H. Mohamed, Professor of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University, Cairo, Egypt for her valuable guidance, planning the research work, encouragement, untiring help and support till completion of my work. She is ideal person known for her punctuality, always active, high thinking, and devotion towards work, loving nature, and affection towards her students. I feel lucky for being with me at times when I needed the most and to have her as my guide. Her gratitude and magnanimity are unforgettable and cannot be expressed in words; the only thing I can repay to her is the eternal reverence from my heart and soul.

I would like to express my gratitude to my esteemed co-supervisor Dr. Hala A. A. Abou-Zeina, Professor of Animal Diseases, National Research Centre, Cairo, Egypt, who supported me very kindly not only in scientific and ongoing work of the experiment, also she input and contributed a lot in terms of expenses for experimental set up, moral support and facilitating my clinical pathology analytic work using the best available laboratory facilities in National Research Centre of Egypt through which I shared in the planning of work as a whole.

I am also expressing my best gratitude to Dr. Khaled M. A. Mahran, Ass. Prof. of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University, who served as a very kind co-supervisor and has given me valuable scientific guidance, good advices and moral support throughout my study period at the faculty.

I am very much grateful to Dr. Soad M. Nasr, Prof. of Clinical Pathology, National Research Centre, Cairo, Egypt, who availed herself all the time to help me in the clinico-pathological analyses and evaluation of the experimental samples. In addition, she did her best to provide me with excellent facilities in her laboratory of clinical pathology.

Special thanks to Dr. Noha M. F. Hassan and Dr. Doaa Sedky, Department of Parasitology and Animal Diseases, National Research Centre, Cairo, Egypt for their help and great support during entire research period either in the field or in the laboratories.

I gratefully thank the academic members of the entire Veterinary Section of the National Research Centre for their kindness and friendship to me.

I am also expressing my best gratitude to the organization of the National Research Centre (NRC) and the Department of Clinical Pathology, Faculty of Veterinary Medicine, Cairo University for their joint financial support in the completion of this study.

It is my pleasure to express my sincere thanks to Dr. Faten F. Mohammed, Department of Pathology, Faculty of Veterinary Medicine, Cairo University for her help in processing of tissue specimens and evaluating of histopathological findings.

I am highly thankful to all my professors at the faculty for their invaluable help, immense support, affection and encouragement throughout my study period. Also I like to express my sincere thankfulness to staff members at the department of Clinical Pathology, Dr. Azza, Dr. Fatma, Dr. Ghada, and Dr. Salma for their excellent

and valuable help to me in many instances of my research work in the clinical pathology laboratory.

I am highly thankful to Dr. Iman Bakr Mohamed, Prof. of Pathology and Vice Dean of Education and Students' Affairs of the faculty and Dr. Jakeen K. El- Jakee, Prof. of Microbiology, and ex-Vice Dean for Post Graduate Studies and Research Affairs, for their good attention toward me in well facilitating of my administrative issues in the faculty during the course of study and research work.

I thank the current officials of the faculty headed by Professor Dr. Khaled El Amry, Dean of the faculty, and staff members of the postgraduate office for their goodwill and better cooperation with my college administrative affairs.

I like to express my sincere thankfulness to Dr. Nancy Badawi, Ph.D student of Clinical Pathology, Faculty of Vet. Med., Cairo University, for her helpful cooperation and valuable advices during my work at the clinical pathology laboratory.

I would like to express my deep sense of gratitude to Dr. Hala Arif, Prof. of toxicology, Faculty of Vet. Med., Cairo University, for her unforgettable kindness, affection, and constant encouragement, confidence, support more importantly friendly environment and given me so much happiness during my study in the Department of Toxicology and Forensic Medicine.

"Where the emotions are involved, words cease to exist." I owe the depth of gratitude and respect to my beloved family whose blessings, affection and love has helped me to tide over difficult stages of my life.

CONTENTS

LIST OF TABLES