Mona maghraby

# بسم اللّه الرحمن الرحيم

## مركز الشبكات وتكنولوجيا المعلومات

## قسم التوثيق الإلكتروني

Mona maghraby

# 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

Mona maghraby


# بعض الوثائق الأصلية تالفة
# وبالرسالة صفحات لم ترد بالأصل

B1A1-0

# STUDIES ON SOME BIOCHEMICAL CHANGES ASSOCIATED WITH BLOOD PARASITE INFECTION IN CATTLE

M. A. El-Seify
14.5.95

**A Thesis Submitted**

By

**AZZA MANSOUR AHMED EL-KATTAWY**

B.V.Sc. Zagazig University (1984).

M.V. Sc. (Biochemistry) Zagazig University (1989).

for

**the degree of Ph. D.**

of Veterinary Medical Science (Biochemistry).

Department of Physiology and Biochemistry .

**Under supervision of**

**Dr.M.A.EL-Seify**

Professor&Chairman of Parasitology Department and Vice Dean of Faculty of Vet Medicine,Kafr EL-Sheikh,Tanta University.

**Dr. Abd El - Hamid Shalaby**

Professor of Gynecology & Obstetrics and Vice -president. of Suez canal University.

**Dr. I.A. Ibrahim**

Professor of Biochemistry and Vice Dean of Faculty of Vet. Medicine

Suez Canal University.

**Dr. Y.L. Awad**

Professor of Biochemistry

Animal Health Research Institute

El-Dokki - Gizza.

**Dr. A.A. El-Ghannam**

Assit. Prof. of Biochemistry , Faculty of Vet. Medicine,

Suez Canal University.

Presented to Faculty of Vet. Med. Kafr El-Sheikh,

Tanta University.

(1995)

**Department of Physiology and Biochemistry**
**Faculty of Vet. Medicine Kafr El-Sheikh**
**Tanta University**

# Approval Sheet

This is to approve that the dissertation presented by Assistant Lecturer **Azza Mansour Ahmed El-Kattawy** to Tanta University

Entitled : " Studies on Some Biochemical Changes Associated with Blood Parasite Infection in Cattle"

For the degree of Ph. D . Vet . Medical Science " Biochemistry "

Has been approved by the examining committee : -

Signature

1- Dr .Y .M. Shehata Professor of Biochemistry Faculty of Vet. Medicine,Zagazige University.

2- Dr . I . F . Hassan Professor of Biochemistry Faculty of Vet. Medicine Idfina , Alexandria University.

3- Dr . I . A . Ibrahim Professor of Biochemistry and Vice Dean Faculty of Vet. Medicine Suez Canal University. ( Supervisor )

4- Dr.M .A. El- Seify Professor and Chairman of Parasitology Department and Vice Dean Faculty of Vet. Medicine Kafr El- Sheikh ,Tanta University. ( Supervisor )

7.5.1995

# *ACKNOWLEDGEMENT*

*First and foremost, my deep gratefuleness and indebtedness is to Allah .*

I would like to express my sincere thanks to ***Dr.M.A. El-Seify*** Professor & Chairman of Parasitology Department and Vice Dean of Faculty of Vet. Medicine, Tanta University for his supervision, valuable guidance and help.

My particular thanks and gratefulness to ***Dr. Abd El- Hamid Shalaby*** Professor of Gynecology & Obstetrics and Vice - President of Suez Canal University for his supervision and continuous help .

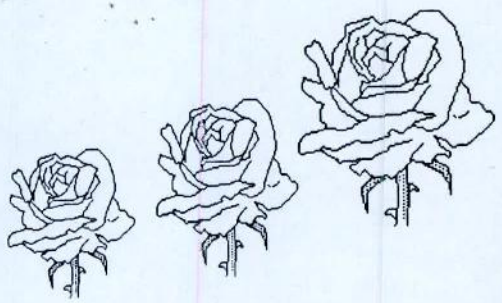
I would like to offer my deep appreciation and profound thanks to ***Dr. I.A. Ibrahim*** Professor of Biochemistry and Vice Dean Faculty of Vet. Medicine Suez Canal University for his supervision helpful instructions and support .

Wording is not enough to express my sincere thanks and gratitude to ***Dr. Y.L. Awad*** Professor of Biochemistry, Animal Health Research Institute El-Dokki , Giza . for his efficient and indespensible help .

My particular thanks and gratefulness to ***Dr. A. A. El - Ghannam*** Assitant Professor of Biochemistry Faculty of Vet. Medicine Suez Canal University for his efficient and indenspensible help.

I would like to offer my appreciation to ***Dr. Kh. Khilo*** lecturer of Biochemistry Faculty of Vet. Medicine Tanta University for his helpfull .

I am indebted to ***Dr. Adel Emad El - Din*** Animal Health Research Institute Tanta Laboratory and ***Dr. N. M. El-Bahy*** lecturer of Parasitology Faculty of Vet. Medicine Tanta University for their tremendous help to compelete this work .



Dedicated To .....

My parents
My husband
My son Mostafa
My daughters
Marwa and Muy

*I THANK THEM ALL*

# CONTENTS


| | PAGE |
|---|---|
| INTRODUCTION | 1 |
| REVIEW OF LITERATURE | 4 |
| MATERIAL AND METHODS | 40 |
| RESULTS | 63 |
| DISCUSSION | 111 |
| SUMMARY | 134 |
| CONCLUSION | 140 |
| REFERENCES | 141 |
| VITA | 165 |
| ARABIC SUMMARY | --- |

# LIST OF TABLES

Page

**Table (1)** : Glutathione peroxidase activity in blood of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 81

**Table (2)** : Glutathione peroxidase activity in blood of Cattle infected with *Theileria annulata* before and after treatment with Berenil ..... 81

**Table (3)** : Superoxide dismutase activity in blood of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin.....83

**Table (4)** : Superoxide dismutase activity in blood of Cattle infected with *Theileria annulata* before and after treatment with Berenil.....83

**Table (5)** : Reduced glutathione level in blood of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin.....85

**Table (6)** : Reduced glutathione level in blood of Cattle infected with *Theileria annulata* before and after treatment with Berenil .....85

**Table (7)** : Glucose - 6 - phosphate dehydrogenase activity in RBCs of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 87

**Table (8)** : Glucose - 6 - phosphate dehydrogenase activity in RBCs of Cattle infected with *Theileria annulata* before and after treatment with Berenil ..... 87

**Table (9)** : Cholinesterase activity in blood of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 89

**Table (10)** : Cholinesterase activity in blood of Cattle infected with *Theileria annulata* before and after treatment with Berenil ..... 89

**Table (11)** : Lactate dehydrogenase activity in serum of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 91

**Table (12) :** Lactate dehydrogenase activity in serum of Cattle infected with *Theileria annulata* before and after treatment with Berenil ..... 91

**Table (13)** : Blood picture of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 93

**Table (14)** : Blood picture of Cattle infected with *Theileria annulata* before and after treatment with Berenil ..... 95

**Table (15)** : Total iron binding capacity, iron and latent iron binding capacity in serum of Cattle infected with *Babesia bigemina* before and after treatment with Acaprin ..... 97

**Table (16)** : Total iron binding capacity, iron and latent iron binding capacity in serum of Cattle infected with *Theileria annulata* before and after treatment with Berenil..... 97

**Table (17)** : Relationship between Glutathione peroxidase activity and Selenium concentration in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 99

**Table (18)** : Relationship between Glutathione peroxidase activity and Selenium concentration in blood of Cattle infected with *Theileria annulata* and treated with Berenil ..... 99

**Table (19) :** Enzymes correlation in blood of Cattle ( control group) ..... 101

**Table (20) :** Enzymes correlation in blood of Cattle infected with *B. bigemina* before treatment ..... 101

**Table (21)** : Enzymes correlation in blood of Cattle infected with *B. bigemina* two hours after treatment with Acaprin ..... 102

**Table (22)** : Enzymes correlation in blood of Cattle infected with *B. bigemina* twenty four hours after treatment with Acaprin ... 102

**Table (23)** : Enzymes correlation in blood of Cattle infected with *B. bigemina* one week after treatment with Acaprin ..... 103

**Table (24)** : : Enzymes correlation in blood of Cattle infected with *B. bigemina* two weeks after treatment with Acaprin ..... 103

**Table (25)** : : Enzymes correlation in blood of Cattle infected with *B. bigemina* three weeks after treatment with Acaprin ..... 104

**Table (26)** : Enzymes correlation in blood of Cattle infected with *T. annulata* before treatment ..... 104

**Table (27)** : Enzymes correlation in blood of Cattle infected with *T. annulata* two hours after treatment with Berenil ..... 105

**Table (28)** : Enzymes correlation in blood of Cattle infected with *T. annulata* twenty four hours after treatment with Berenil ..... 105

**Table (29)** : Enzymes correlation in blood of Cattle infected with *T. annulata* one week after treatment with Berenil ..... 106

**Table (30)** : Enzymes correlation in blood of Cattle infected with *T. annulata* two weeks after treatment with Berenil ..... 106

**Table (31)** : Enzymes correlation in blood of Cattle infected with *T. annulata* three weeks after treatment with Berenil ..... 107

# LIST OF FIGURES

Page

**Figure (1)** : Glutathione peroxidase activity in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 82

**Figure (2)** : Glutathione peroxidase activity in blood of Cattle infected with *Theileria annulata* and treated with Berenil ..... 82

**Figure (3)** : Superoxide dismutase in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 84

**Figure (4)** : Superoxide dismutase in blood of Cattle infected with *Theileria annulata* and treated with Berenil ..... 84

**Figure (5)** : Reduced glutathione level in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 86

**Figure (6)** : Reduced glutathione level in blood of Cattle infected with *Theileria annulata* and treated with Berenil ..... 86

**Figure (7)** : Glucose - 6 - phosphate dehydrogenase in RBCs of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 88

**Figure (8)** : Glucose - 6 - phosphate dehydrogenase in RBCs of Cattle infected with *Theileria annulata* and treated with Berenil ..... 88

**Figure (9)** : Cholinesterase activity in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin..... 90

**Figure (10)** : Cholinesterase activity in blood of Cattle infected with *Theileria annulata* and treated with Berenil ..... 90

**Figure (11)** : Lactate dehydrogenase activity in serum of Cattle infected with *Babesia bigemina* and treated with Acaprin .....92

**Figure (12)** : Lactate dehydrogenase activity in serum of Cattle infected with *Theileria annulata* and treated with Berenil .....92

**Figure (13)** : Blood picture of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 94

**Figure (14)** : Blood picture of Cattle infected with *Theileria annulata* and treated with Berenil ..... 96

**Figure (15)** : Total iron binding capacity, iron and latent iron binding capacity in serum of Cattle infected with *Babesia bigemina* and treated with Acaprin..... 98

**Figure (16)** : Total iron binding capacity, iron and latent iron binding capacity in serum of Cattle infected with *Theileria annulata* and treated with Berenil. ..... 98

**Figure (17)** : Relation between GSHpx and Se in blood of Cattle infected with *Babesia bigemina* and treated with Acaprin ..... 100

**Figure (18)** : Relation between GSHpx and Se in blood of Cattle infected with *Theileria annulata* and treated with Berenil. ..... 100

# Photos

page

**Photo (1)** : Blood film of Cattle infected with *Babesia bigemina* "stained with Geimsa". Showing *Babesia bigemina* stages in RBCs before treatment .....108

**Photo (2)** : Blood film of Cattle "stained with Geimsa" three weeks, after treatment showing apparently non-infected RBCs . ..... 108

**Photo (3)** : Blood film of Cattle infected with *Theileria annulata* "stained with Geimsa". Showing *Theileria annulata* ring form in RBCs before treatment (A) and after treatment (B & C) ..... 109

**Photo (4)** : Blood film of Cattle infected with *Theileria annulata* "stained with Geimsa". Showing Macro and Micro - schizonts in lymphocyte before treatment ..... 109

**Photo (5)** : Blood film of Cattle "stained with Geimsa" three weeks, after treatment showing apparently non-infected lymphocyte. ..... 110

# LIST OF ABBREVIATION

| | |
|---|---|
| GSHPx, GSHpx, GSH peroxidase | : Glutathione Peroxidase |
| SOD | : Superoxide Dismutase |
| GSH | : Reduced Glutathione |
| G - 6 - PDH, G - 6 - PD | : Glusose - 6 - Phosphate Dehydrogenase |
| ChE, ACHE | : Cholinesterase |
| LDH, LD | : Lactate Dehydrogenase |
| GSSG | : Oxidized form of Glutathione |
| RBCs | : Erythrocytic Count |
| Hb | : Haemoglobin Concentration |
| PCV % | : Packed Cell Volume |
| MCV | : Mean Corpuscular Volume |
| MCH | : Mean Corpuscular Haemoglobin |
| MCHC% | : Mean Corpuscular Haemoglobin Concentration |
| TIBC | : Total Iron Binding Capacity |
| LIBC | : Latent Iron Binding Capacity |
| *T.annulata* | : *Theileria annulata* |
| *B. bigemina* | : *Babesia bigemina* |
| *B. rodhaini* | : *Babesia rodhaini* |