

بسم الله الرحمن الرحيم



HOSSAM MAGHRABY



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



HOSSAM MAGHRABY

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



HOSSAM MAGHRABY



بعض الوثائق الأصلية تالفة



HOSSAM MAGHRABY



بالرسالة صفحات

لم ترد بالأصل



HOSSAM MAGHRABY

Cairo University
Faculty of Veterinary Medicine
Department of Virology

Handwritten signature

El-Hes

Studies on VIA antigen of Foot and Mouth Disease virus

B 10 479

*A Thesis
presented by.*

Abeer Ahmed Talaat Mahmoud

B.V.Sc. (1991), Cairo University
for the degree of
Master of Veterinary Science (M.V.Sci.)
(Virology)

Under Supervision of

Prof. Dr. Mohamed Sami Saber

Prof. of Virology,
Faculty Veterinary Medicine,
Cairo University.

Dr. Adel Omar Abd-El-Rahman

Chief Researcher and Head of FMD Department,
Vet. Serum and Vaccine Research Institute, Abbasia, Cairo, Egypt.

{ 1997 }

APPROVAL SHEET

This is to approve that the dissertation presented by *Abeer Ahmed Talaat Mahmoud* to Cairo University entitled :

"Studies on VIA antigen of Foot and Mouth Disease virus"

For the degree of M.V.Sc. (Virology) has been approved by the examining committee :

1. *Prof. Dr. Ahmed Daoud*

Director of Veterinary Serum and Vaccine
Research Institute, Abbasia, Cairo.

Ahmed Daoud

2. *Prof. Dr. Ismail Mohamed Reda*

Prof. of Virology
Faculty of Veterinary Medicine,
Cairo University,

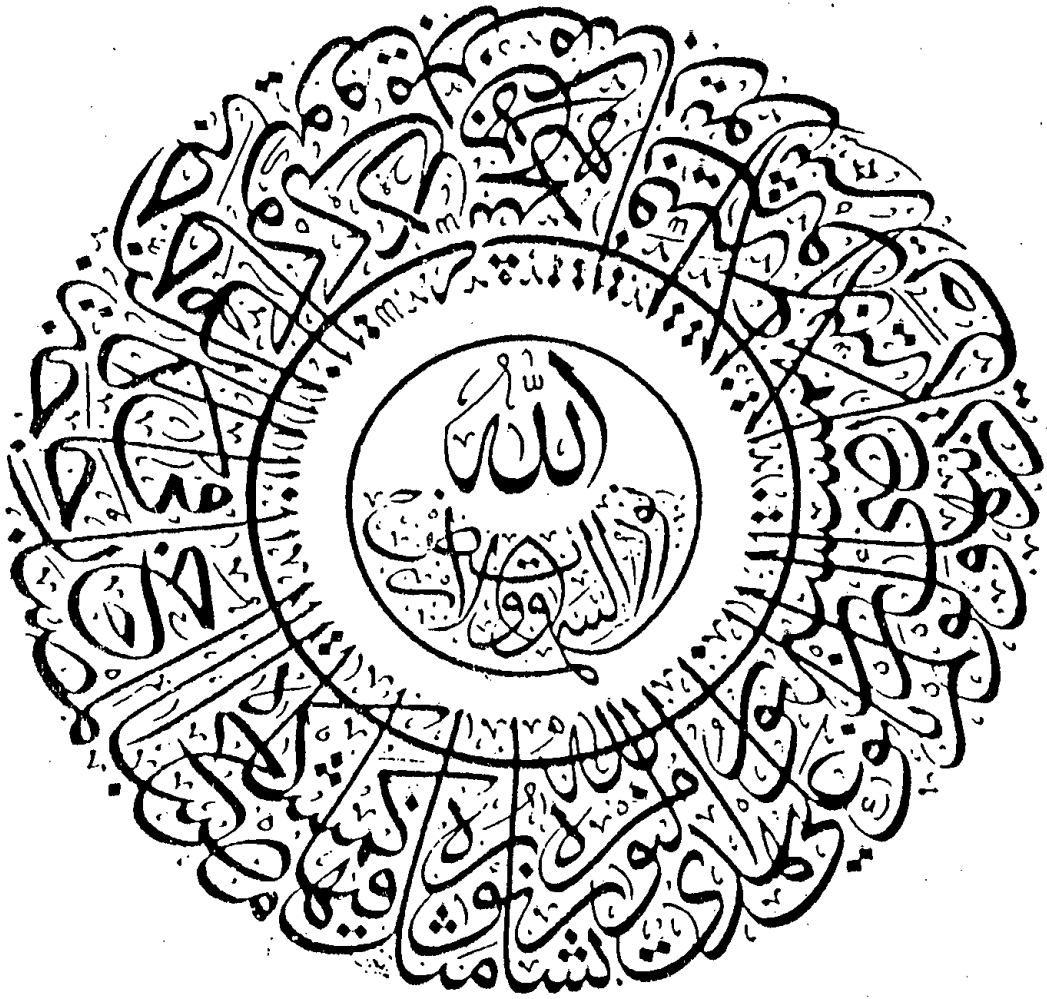
I. M. Reda

3. *Prof. Dr. Mohamed Sami Saber*

Prof. of Virology
Faculty of Veterinary Medicine,
Cairo University,
(Supervisor)

M. S. Saber

Date : 4/1/1998.





ACKNOWLEDGEMENT

*I would like to express my sincere gratitude for the kindness and encouragement of **Prof. Dr. Mohamed Sami Saber**, Professor of Microbiology, Faculty of Veterinary Medicine, Cairo University, under whose stimulating supervision guidance and criticism, this work was carried out and theartly thank him very much for his interest so as to complete this thesis as precisely as it is.*

*Gratitude is also offered to **Dr. Adel Omar Abdel Rahman**, Senior Researcher and Head of FMD Department, Veterinary Serum and Vaccine Research Institute, Abbasia, Cairo, for his association in supervision and help throughout this work.*

*Thanks to the **Prof. Dr. Ahmed Daoud**, Director of the Veterinary Serum and Vaccine Research Institute, Abbasia, Cairo, for his kind assistance.*

*Thanks also to **Dr. Mohamed S.E. Abd El-Mouty**, Researcher at FMD Department, Veterinary Serum and Vaccine Research Institute, Abbasia, Cairo, for his great help, kind assistance and cooperation throughout the work of this thesis.*

*I am really feel thankful and record my grateful acknowledgment to **my family** for encouragement and support me.*





LIST OF CONTENTS

	Page
1. INTRODUCTION	1
2. REVIEW OF LITERATURE	4
2.1. Foot and Mouth Disease Virus	4
2.2. Foot and Mouth Disease in Egypt	5
2.3. Foot and Mouth Disease in the world	6
2.4. Classification of FMD virus	7
<i>2.4.1. Types and subtypes of FMD virus</i>	8
<i>2.4.2. Physico-chemical properties of FMD virus</i>	9
2.4.2.1. Effect of pH	9
2.4.2.2. Effect of Heat	11
2.4.2.3. Effect of dicationic salts	11
<i>2.4.3. Antigenic components of FMD virus</i>	12
2.4.3.1. Structural antigens	12
2.4.3.2. Non structural antigen	13
2.5. Carrier state of Foot and Mouth Disease	19
2.6. Laboratory diagnosis technique	22
<i>2.6.1. Enzyme Linked immuno-Sorbent Assay (ELISA)</i>	22





	Page
2.6.2. Serum Neutralization Test (SNT)	27
2.6.3. Agar Gel Diffusion/Precipitation Test	31
3. MATERIAL AND METHODS	32
3.1. Material	32
3.1.1. Virus	32
3.1.2. Animals	32
3.1.2.1. Cattle	32
3.1.3. Cell culture	33
3.1.3.1. Baby Hamster Kidney cell line (BHK21) clone 13	33
3.1.4. Biological reagent	33
3.1.4.1. Sera and antisera	33
3.1.4.2. VIA antigen (Positive control VIA antigen)	34
3.1.5. Chemical Reagents	34
3.1.5.1. Media	34
3.1.5.2. Solutions and buffers	35
3.2. Methods	40
3.2.1. Animal Inoculation	40
3.2.2. Sample preparation	40
3.2.2.1. Tongue epithelium	40
3.2.2.2. Collection of serum samples	41
3.2.3. Preparation of VIA antigen	41





	Page
3.2.4. Preparation of positive control serum	42
3.2.5. Standardization of prepared VIA	43
antigen and its specific antiserum	
3.2.6. Virus titration	43
3.2.6.1. In tissue culture	43
3.2.7. Serum Neutralization Tesy	44
3.2.8. Solid Phase Enzyme Linked Immuno	44
Sorbent Assay	
3.2.9. Agar Gel Precipitation Tesy	45
4. EXPERIMENT AND RESULTS	47
5. DISCUSSION	65
6. SUMMARY	70
7. REFERENCES	72
ARABIC SUMMARY.	





LIST OF TABLES

<i>Table</i>	<i>Title</i>	<i>Page</i>
1	The clinical signs findings in experimentally infected calves with FMD virus	48
2	Comparative studies between VIA prepared from tongue epithelium of experimentally infected calves and VIA prepared from infected BHK clone21 cells.	50
3	Detection of VIA antibodies in serum samples collected weekly intervals from experimentally infected calves	56
4	Antibody levels against VIA antigen of FMD virus O1/3/93, Aga in serum samples collected from Upper Egypt Provinces	58
5	Antibody levels against VIA antigen of FMD virus O1/3/93, Aga in serum samples collected from Lower Egypt Provinces	60
6	Antibody levels against VIA antigen of FMD virus O1/3/93, Aga in serum samples collected from border Egypt Provinces	62
7	Comparative studies between antibody levels to the whole FMD virus and VIA antigen of FMDV in serum samples collected from different species in different Egyptian provinces	64





LIST OF FIGURES

<i>Figure</i>	<i>Title</i>	<i>Page</i>
1	Estimation of the highest titre of VIA antigen give positive results using reference VIA hyperimmune serum	52
2	Standardization of VIA antigen by agar gel precipitation test to estimate the highest titre give positive result.	54





LIST OF ABBREVIATION

AEI	: Acetyleneimine
AGPT	: Agar Gel Precipitation Test
BHK	: Baby Hamster Kidney
CFT	: Complement Fixation Test
DID	: Double Immuno Diffusion
ELISA	: Enzyme Linked Immuno Sorbent Assay
EPP	: Estimated Percentage Protection
ET	: Epithelial Tongue
FMD	: Foot and Mouth Disease
LPBE	: Liquid Phase Blocking Sandwich ELISA
MPT	: Mouse Protection Test
OP	: Oesophageal Pharyngeal
OPD	: Orthophenylene Diamine
PBS	: Phosphate Buffer Saline
PCB	: Phosphate Citrate Buffer
PEG	: Polyethylene Glycol
PI	: Post Infection
SNT	: Serum Neutralization Test
TCID ₅₀	: Tissue Culture Infective Dose 50

