بسم الله الرحمن الرحيم

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بالرسالة صفحات

لم ترد بالأصل

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Some Molecular Studies on Infectious Bursal Disease Virus

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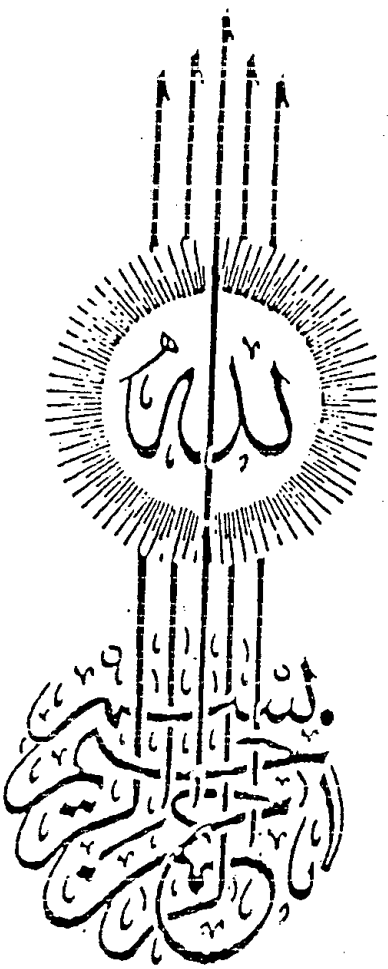

" وعلم آدم الأسماء كلها ثم عرضهم على الملائكة
فقال أنبئوني بأسماء هؤلاء إن كنتم صادقين .
قالوا سبحانك لا علم لنا إلا ما علمتنا
إنك أنت العليم الحكيم "

" صدق الله العظيم "
(سورة البقرة . الآية ٣١ ، ٣٢)

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Dedication

To who stood beside me, providing me with their help and urge to study. To those who encouraged me to carry on research, who paved my way with their patience, love and sacrifice. I devote my self and my thesis to them to my mother and brothers.

Sherif Mahmoud Mohamed

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List of abbreviations

AMV Rtase: Avian Myeloblastosis Virus reverse transcriptase enzyme.
bp : base pair.
CAM : Chorio allantoic membrane.
cDNA : complementary DNA.
CEF : Chicken embryo fibroblasts.
CPE : Cyto Pathic Effect.
Cs Cl : Cesium chloride.
$D_{20,w}$: Diffusion coefficient in water at 20^0C.
D.D. water : double distilled water.
DEPC : Di-Ethyl PyroCarbonate.
DIA : Dot Immunoblot Assay.
DMSO : Dimethyl sulfoxide.
DNA : deoxy ribonucleic acid.
dNTPs : deoxy nucleotide triphosphates.
dsRNA : double stranded RNA.
DTT : Di-Thio Theriotol.
EID_{50} : Egg Infective Dose fifty.
ELISA : Enzyme Linked Immuno Sorbent Assay.
IBD : Infectious Bursal Disease.
IBDV : Infectious Bursal Disease Virus.
kb : kilo base.
kDa : kilo Dalton.
MCAs : Mono Clonal Antibodies.
nm. : nano meter.
OD : optical density.
ORF : Open Reading Frame.
RE : Restriction Endonuclease.
RFLP : Restriction Fragment length polymorphism.
RNA : Ribonucliec acid.
RT/PCR : Reverse transcription/Polymerase Chain reaction.
$S_{20,w}$: sedimentation coefficient in water at 20^0C.
SDS-PAGE: Sodium Dodecyl Sulphate-Polyacrylamide gel electrophoresis.
TAE : Tris Acetate EDTA.
TBS : Tris Buffered saline.
$TCID_{50}$: Tissue Culture Infective Dose fifty.
TTBS : Tween Tris Buffered Saline.
V/cm : Volt per centimeter.

Introduction

1. INTRODUCTION

Infectious Bursal Disease (IBD) is an acute, extremely stable, highly infectious and immunosuppressive viral infection of young chickens which is probably present wherever poultry are reared, causing severe economic losses represented by increased mortality and unsatisfactory responses to vaccination rendering birds susceptible to many intercurrent infections **(Faragher et al., 1972)** . IBD is characterized by enlarged bursa of fabricious and severe renal damage . IBD has a striking involvement of primary lymphoid organs in the form of lymphocytic necrosis substituted with polymorphnuclear cells with severe hemorrhage and edema **(Ivayni and Morris, 1976).**

In 1957, the disease was first recognized near the community of Gumboro, Delaware, USA, as a syndrome later termed "Avian Nephrosis" referring to the extreme kidney damage in field cases of the disease **(Cosgorove, 1962).**

The causative agent was isolated in embryonated chicken eggs and was referred to as "Infectious Bursal Agent" **(Winterfield et al., 1962).**

Later Infectious Bursal Disease have been proposed as the name of the disease since it causes specific pathognomonic lesions in the cloacal bursa **(Hitchner, 1970)**.

Infectious Bursal disease virus (IBDV) is classified as a member of Family *Birnaviridae* since it has a bi-segmented double stranded RNA genome **(Dobos et al., 1979).**

IBDV genome segment A is approximately 3300 base pairs in length and contains one large open reading frame (ORF) that encodes a 110 Kilo Dalton poly-protein that is cleaved into three viral proteins designated as VP-2, VP-3, and VP-4. VP-2 carries the serotype specific antigens responsible for the induction of neutralizing protective antibodies. There are at least two virus neutralizing epitopes on VP-2, one of it is strictly serotype specific, whereas VP-3 contains the group specific antigens. Genome segment B is approximately 2900 base pairs in length and encodes VP-1 **(Kibenge et al., 1988a).**

Two serotypes of IBDV, serotype-1 and serotype-2, are currently recognized. All subtypes of serotype 1 are pathogenic to chickens,

whereas all known serotype-2 viruses are non pathogenic to chickens. **(Ismail et al.,1988).**

In Egypt, **EL-Sergany et al. (1974)** reported for the first time the occurrence of IBDV infection among commercial broiler chickens on the basis of histopathological examination. **Ayoub and Malek (1976)** were the first who managed to isolate and identify the causative agent of IBDV in Egypt. **Mousa et al., (1986)** isolated IBDV strains from turkeys and identified them as non-serotype-1 IBDVs. **Mousa and Saif Edeen (1990)** demonstrated the results of epidemiological studies of IBDV infection among both chicken and turkey flocks in Upper Egypt during the period 1985-1989. Since that time, many severe outbreaks were reported in vaccinated chicken flocks with high losses reaching 70% in layer pullets and 30% in meat type broilers **(Khafagy et al., 1990).**

Several serotype-1 strains isolated since 1984 were designated as variant viruses, in comparison with viruses recognized earlier, which are designated as classical strains(**Saif, 1984).**

Antigenic diversity was detected among the classic and variant strains of serotype-1 IBDV **(Jakwood et al., 1987).**

Despite recent advances in vaccination programs, outbreaks of IBDV still occur. Variant strains have been isolated from commercial flocks of chickens that had high levels of maternal antibodies to IBDV **(Ismail et al., 1990).**

Antigenic variations among variant and classical strains of serotype 1 IBDV is probably responsible for failures of vaccination programs and maternal immunity when these variants no longer coincide with the antigenic structure of the commonly used vaccinal strains. Therefore diagnosis of serotype-1 variants is important when designing vaccination programs against IBDV **(Ismail and Saif, 1991).**