



**UNIVERSITI PUTRA MALAYSIA**

**STUDIES ON MALAYSIAN ISOLATES OF ORF VIRUS**

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**STUDIES ON MALAYSIAN ISOLATES OF ORF VIRUS**

**By**

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**Dissertation Submitted in Fulfilment of the Requirements  
for the Degree of Doctor of Philosophy in the Faculty  
of Veterinary Medicine and Animal Science  
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**Dedicated with love and gratitude to, my wife Suaad T.Ameen  
and my son Mohammad**



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## LIST OF ABBREVIATIONS

Ab	Antibody
ABTS	2,2-azino-bis(3-ethylbenzthiazoline-6-Sulfonic acid)
AGPT	Agar Gel Pricipitation Test
AO	Acridin Orange
ATI	A-Type Inclusion Body
ATV	Antibiotic Trypsin Versin
BEL	Bovine Embryonic Lung
BHK-21	Baby Hamester Kidney-21
bp	Base Pairs
°C	Degree Celcius
CAM	Chorioallantoic Membrane
CEF	Chicken Embryo Fibroblast
cm	Centimeter
cm <sup>2</sup>	Centimeter square
CO <sub>2</sub>	Carbon dioxide
CPE	Cytopatic Effect
DNA	Deoxyribonucleic Acid
Dr	Doctor
D.W.	Distilled Water
EDTA	Ethylene Diamine Tetra-acetate
ELISA	Enzyme Linked Immunosobent Assay
EM	Electron Microscope
FBS	Foetal Bovine Serum



FCS	Fetal Calf Serum
FOH	Fetal Ovine Heart
FOL	Fetal Ovine Lung
FOM	Fetal Ovine Muscle
FOS	Fetal Ovine Skin
g	Gram
H&E	Hematoxylin and Eosin
HeLa cell	Cervical Carcinoma Cell
HIS	Hyperimmune Serum
hrs	Hours
I	Inclusion body
IBRv	Infectious Bovine Rhinotrachitis virus
I.C.T.V.	International Committee on Taxonomy of Viruses
IgG	Immunoglobulin G
IIF	Indirect Immuofluorescent
IIP	Indirect Immunoperoxidase
i/m	Intramuscular
i/v	Intravenous
Kbp	Kilobase pairs
kD	Kilodalton
KK	Kid Kidney
KL	Kid Lung
KT	Kid Testis
L cell	Adrnal Mouse Fibroblast
LK	Lamb Kidney
LLC-MK2	Rhesus Macaque Kidney



LT	Lamb Testis
M	Molar
MA104	Monkey kidney cell line
MDOK	Madin-Darby Ovine Kidney
MDBK	Madin-Darby Bovine Kidney
ME	Mercapto Ethanol
MEM	Minimum Essential Medium
mg	Miligram
MK2	Rhesus Macaque Kidney
mM	Milimolar
mm	Milimeter
m.w.	Molecula Weight
NCEM	Negative Contrast Electron Microscope
nm	nanometer
NZ2	New Zealand strain number 2 of orf virus
NZ7	New Zealand strain number 7 of orf virus
OD	Optical Density
OEL	Ovine Embryonic Lung
O.M.	Original Magnification
OT	Ovine Testis Cell Line
PAGE	Polyacrylamid Gel Electrophoresis
PBS	Phosphate Buffer Saline
pH	Hydrogen-ion concentration
PI	Post Inoculation
PTA	Phosphotungstic Acid
RE	Restriction Endonuclease



RK13	Rabbit Kidney
rpm	Revolution per minute
SDS	Sodium Dodecyl Sulphate
SNT	Serum Neutralization Test
SPF	Specific Pathogen Free
SVP	Cell line derived from kidney of swine
TBS	Tween Buffer Saline
TC	Tissue Culture
TCID <sub>50</sub>	Fifty percent tissue culture infective dose
TE	Tris-EDTA
TEM	Transmission Electron Microscope
TEN	Tris-EDTA-NaCl
TPB	Tryptose Phosphate Broth
ug	Microgram
ul	Microliter
uM	Micron
UPM	Universiti Pertanian Malaysia
UV	Ultraviolet
v/v	Volume/Volume
Vero	Cell line derived from kidney tissue of green African monkey
w/v	Weight/Volume
w/w	Weight/Weight
xg	Relative Centrifugal Force
%	Percent



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## **STUDIES ON MALAYSIAN ISOLATES OF ORF VIRUS**

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**Faculty : Veterinary Medicine and Animal Science**

This study was conducted to isolate and characterize several orf viruses infecting sheep and goats in Malaysia. The isolates and two reference strains of orf virus were then compared with respect to biological properties, serological properties, protein profile and also DNA profile.

Three orf viruses were isolated from infected goats and one from infected sheep. They were identified as orf viruses by means of electron microscope and three serologic tests namely, serum neutralization, immunoperoxidase and immunofluorescent tests. The isolates grew well in cell cultures prepared from goat and sheep, and on chorioallantoic membrane of hen eggs but not in several tested continuous cell lines.

Compared to the other two established orf virus strains, cytopathic effect induced by these isolates in kid testis cell culture differed with respect to the time

