Virus Name: Kowanyama	Abbreviation: KOWV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Results of SALS surveys and information from the Catalogue.

Other Information

Antigenic Group
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
MRM1178

Accession Number

Original Date Submitted
12/5/1984

Family
Bunyaviridae

Genus
Bunyavirus-like

Information From
R.L. Doherty

Address
Queensland Institute of Medical Research, Brisbane, Australia

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Doherty, et al. (1)

Isolated at Institute
Brisbane

Host Genus
Anopheles annulipes Walker

Species

Host Age/Stage
Adult

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
Light trap

Collection Date
11/13/1963

Place Collected (Minimum of City, State, Country)
Mitchell River Mission, Australia

Latitude
15° 30' S

Longitude
141° 40' E

Macrohabitat
Low-lying plain bordering Gulf of Carpentaria

Microhabitat

Method of Storage until Inoculated
Transported to Brisbane on dry ice, then in -60dC Revco

Footnotes

Section III - Method of Isolation

Inoculation Date
1/9/1964

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation

Other Reasons

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used
Two other isolations from same area

Footnotes

Section IV - Virus Properties

Physicochemical

Pieces (number of genome segments)	Infectivity	Sedimentation Coefficients(s) (S)
Percentage wt, of Virion Protein	Lipid	Carbohydrate
Virion Polypeptides: Number	Details	
Non-virion Polypeptides: Number	Details	
Virion Density	Sedimentation Coefficients(s) (S)	
Nucleocapsid Density	Sedimentation Coefficients(s) (S)	

Stability of Infectivity (effects)

pH (infective range)

Lipid Solvent (ether - % used to test)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:500**	After Treatment Titer **<3.0 dex**	Control Titer **4.6 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **85 - 90 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (3)**	Surface Projections/Envelope **Envelope observed (3)**	Nucleocapsid Dimensions, Symmetry

Morphogenesis

Site of Constituent Formation in Cell	Site of Virion Assembly	Site of Virion Accumulation
Inclusion Bodies	Other	

Hemagglutination

Hemaggiutination	Antigen Source	Erythrocytes (species used)
Yes	**SMB, blood, liver, carcass ext. by sucrose-acetone + prot. tr.**	**Goose**
pH Range	pH Optimum	
6.0-7.6	**5.75, 6.0**	
Temperature Range	Temperature Optimum	

Remarks
Shows HA when VAD contains 0.4 M NaCl (8)

Serologic Methods Recommended
CF

Footnotes
Shows HA when VAD contains 0.4 M NaCl (8)

Section V - Antigenic Relationship and Lack of Relationship to Other Viruses

Studies at QIMR, Brisbane: No relationship demonstrated by CF and neutralization test to MVE, Kunjin, Kokobera, Edge Hill, Stratford, Sindbis (MRM39), Ross River, Getah, Bebaru, Koongol, Wongal, Mapputta, Corriparta and Eubenangee (MRM1178 homologous CF = 64/32).
Studies at Yale University Department of Epidemiology and Public Health (Dr. J. Casals).

MRM1178 antigen (homologous titre = 128/64) tested by CF against antisera to the following viruses with no reactions found.

Group A polyvalent	Ilesha
Group B polyvalent	Uukuniemi
California encephalitis	Kairi
Colorado tick fever	Kemerovo
Hughes	Manzanilla
Wad Medani	Oropouche
Quaranfil	Silverwater
Chenuda	Simbu
Nyamanini	Thogoto
Eretmapodites 147	Tacaiuma
Mouse encephalomyelitis (GDI)	Tacaribe
Guaroa	Calovo
Mouse hepatoencephalitis	Turlock
Ganjam	Congo
IG673	Wyeomyia
Bhanja	California group polyvalent

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Newborn mice

Cell system (a)	Virus passage history (b)	Evidence of Infection							
		CPE			PLAQUES			Growth Without CPE	
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	+/- (g)	
PS (CL)	P-4				4	1 mm	6.0* (1)		
Vero (CL)	P-Unk.				6	5 mm	6.0 (6)		
LLC-MK2 (CL)					3	1 mm	7.2 (6)		
PS (CL)			CPE (7)						
BHK-21 (CL)			CPE			Plaques (7)			
VSW (CL)			CPE			Plaques (7)			

* Expressed in dex

Section VII - Natural Host Range (Additional text can be added below table)

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Anopheles annulipes	2/171		Queensland, Australia
Anopheles amictus amictus	1/69		Queensland, AS, Oct.-Nov. 1963
Man		0/69 NT	Queensland, AS
Domestic fowl		1/47 NT	
Horse		6/31 NT	
Kangaroos		5/11 NT	

Subsequent tests have shown that neutralizing antibody in man was only in adult Aborigenes from north Queensland (4,5), and more extensively in cattle, horses, sheep, pigs, kangaroos, wallabies, bandicoots, rats and wild birds (5).

Section VIII - Susceptibility to Experimental Infection (include viremia)

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log10/ml
Mice (nb)	P-4	ic 0.015	Death	5	6.8
Mice (nb)		ip 0.03	Death	9	3.5
Mice (nb)		sc			
Mice (wn)		ic 0.03	None		<3.5
Mice (wn)		ip	Production of antibody		
(nb)	P-12	ip 0.015	Death	4-5	7.5
(nb)		ip 0.03	Death	5-7	6.7

Section IX - Experimental Arthropod Infection and Transmission

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmision by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Culex quinquefasciatus	Adult female intrathoracically inoculated with 0.0006 ml;virus multiplication demonstrated by titration in mice; 5.3/mosquito after inoculation; <1.3/mosq. at 12 hours; 5.0/mosq. at 10 days; 4.0/mosq. at 20 days. Serial passage of salivary gland by intrathoracic inoculation, first passage successful, second and third negative.								

Section X - Histopathology

Character of lesions (specify host)

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature	Residual	Death
Subclinical	Overt Disease	

Clinical Manifestations

Number of Cases — Category (i.e. febrile illness, etc.)

Section XII - Geographic Distribution

Known (Virus detected)
Australia

Suspected (Antibody only detected)

Section XIII - References

1. Doherty, R.L., et al. 1968. Trans. R. Soc. Trop. Med. Hyg. 62:430-438.
2. Standfast, H.A. and Carley, J.G. Personal communication.
3. Holmes, I.H. 1971. Personal communication.
4. Doherty, R.L. 1967. Aust. Paedriat. J. 3:213-218.
5. Doherty, R.L., et al. 1970. Trans. R. Soc. Trop. Med. Hyg. 64:748-753.
6. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
7. Director, Queensland Inst. Med. Res. 1971. Unpublished observations.
8. Shope, R.E. Personal communication. 1977.

Remarks