

Virus Name: Warrego		Abbreviation: WARV
Status Possible Arbovirus	Select Agent No	SALS Level 2
SALS Basis Results of SALS surveys and information from the Catalogue.		
Other Information		
Antigenic Group Warrego		

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation Ch9935	Accession Number	Original Date Submitted 11/19/1984
Family Reoviridae	Genus Orbivirus	
Information From R.L. Doherty	Address Queensland Institute of Medical Research, Brisbane, Q4006, AS	
Information Footnote Reviewed by editor		

Section II - Original Source

Isolated By (name) R.L. Doherty, et al.	Isolated at Institute Brisbane	
Host Genus Culicoides spp.	Species	Host Age/Stage Adult
Sex Female		
<u>Isolated From</u>	<u>Isolation Details</u>	
Signs and Symptoms of Illness	Arthropod	
Time Held Alive before Inoculation		
Collection Method Light trap	Collection Date 2/13/1969	
Place Collected (Minimum of City, State, Country) Charleville, Queensland, Australia		
Latitude 26° 10' S	Longitude 145° 50' E	
Macrohabitat Near Charleville, 965 feet, ann. rain 19.47 inches; open eucalypt forest and grassland	Microhabitat Light trap near Warrego River on edge of town	Method of Storage until Inoculated Overnight at 5dC, transported on liquid nitrogen, then at -60dC in Revco
Footnotes		

Section III - Method of Isolation

Inoculation Date
3/26/1969

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons
Other isolations from Culicoides and mosquitoes collected in same region and period.

Homologous Antibody Formation by Source Animal

Test(s) Used

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) 50% final	After Treatment Titer 4.5 dex	Control Titer 3.8 dex
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) 1:1000 final	After Treatment Titer 3.5 dex	Control Titer 3.9 dex
Other (formalin, radiation)		

Virion Morphology

Shape Spherical; polygonal	Dimensions 67 + 4; 71 + 4 nm	
Mean nm	Range nm	
Measurement Method Thin-section; neg contrast electron microscopy (4)	Surface Projections/Envelope	Nucleocapsid Dimensions, Symmetry Core = 38 + 3 nm: obvious

Morphogenesis

Site of Constituent Formation in Cell Site of Virion Assembly Site of Virion Accumulation

Inclusion Bodies Other

Hemagglutination

Hemagglutination Antigen Source Erythrocytes (species used)
No **SMB, blood ext. by sucrose-acetone + protamine tr., sonication or trypsin** **Goose**

pH Range pH Optimum
6.0-7.6

Temperature Range Temperature Optimum

Remarks

Serologic Methods Recommended
CF

Footnotes

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

Studies at Queensland Institute of Medical Research:

No antigenic relationship was detected by complement-fixation or neutralization tests between Ch9935 antigen or antiserum and the following arboviruses or suspected arboviruses isolated or available in Australia: Group A (Sindbis, Ross River, Getah, Bebaru); Group B (Murray Valley encephalitis, Kunjin, Kokobera, Edge Hill, Stratford, Alfuy, JBE, SLE, dengue types 1, 2, 3, and 4); Koongol group (Koongol, Wongal); Mapputta group (Mapputta, Trubanaman, MK7532); Quarantfil group (Abal); Simbu group (Akabane, Aino [Samford]); Corriparta group (Corriparta); Eubenangee group (Eubenangee); Others (Kowanyama, Almpiwar, Upolu, ephemeral fever, Belmont, Wallal, Charleville, Wongorr and Ngaingan). Relationship to Mitchell River virus (MRM10434 strain), first observed by the International Reference Centre, was confirmed:

Immune Serum or Antigen	Ch9935 Antigen			Ch9935 Immune Serum		
	CF		NT	CF		NT
	Ht/Ho	Ratio	Ht/Ho	Ht/Ho	Ratio	Ht/Ho
Mitchell River (MRM 10434)	<8/64	<1/8	0.8/1.5	8/>128	1/>16	1.3/3.2

NT: LNI in dex.

Studies at International Reference Centre, Yale Arbovirus Unit:

Comparison by complement-fixation test with 24 solvent-resistant arboviruses [3] showed two Australian strains Ch9935 and MRM10434 were related to each other but distinct from others tested.

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Weanling mice

Cell system (a)	Virus passage history (b)	Evidence of Infection						
		CPE			PLAQUES			Growth Without CPE +/- (g)
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	
PS (CL)	SMB 3					Plaques	6.1*	
BHK-21 (CL)			CPE	>5.0 *				
Vero (CL)			CPE	>5.0				
VSW (CL)			CPE	>5.0				

* Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Culicoides spp.	6/25,894		Charleville, Queensland, AS, 1969-70 (1)
Wallaby		12/30	Queensland, AS (1)
Kangaroo		8/21	
Cattle		7/62	
Various vertebrate species		2/346	
Culicoides marksi	1		Charleville, Queensland, AS (1)
C. marksi	1		Beatrice Hill, No. Terr., AS (5)
C. dycei	1		Charleville, Queensland, AS (1)
Anopheles meraukensis	1		Kowanyama, Queensland, AS (6)
Cx annulirostris	1		Charleville, Queensland, AS (1)

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)	SMB 3	ic 0.015	Death	3-4	6.7
Mice (nb)		ip 0.03	No overt signs of infection		<3.5
Mice (nb)		sc			
Mice (wn)		ic 0.03	No overt signs of infection	<3.5	
Mice (wn)		ip 0.1	Antibody production		

Section IX - Experimental Arthropod Infection and Transmission

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Aedes aegypti, SMB 5	Intrathoracically inoculated with 0.0006 ml (3 experiments 0.3-1.2 log10 per mosquito). Assay of virus content by titration in infant mice. Initial eclipse with no virus detectable at 0.5-1 days; increase to 3.9->5.8 log10 10-20 days after inoculation. (2)								

Section X - Histopathology

Character of lesions (specify host)		
<u>Inclusion Bodies</u>	<u>Intranuclear</u>	
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) Charleville, Queensland, Australia
Suspected (Antibody only detected)

Section XIII - References

<ol style="list-style-type: none">1. Doherty, R.L., et al. 1973. Trans. R. Soc. Trop. Med. and Hyg. 67:536-543.2. Carley, J.G., et al. 1973. J. Med. Ent. 10:244-249.3. Borden, E.C., et al. 1971. J. Gen. Virol. 13:261-271.4. Schnagl, R.D. and Holmes, I.H. 1971. Aust. J. Biol. Sci. 24:1151-1162.5. Mahoney, D.F., Chief, CSIRO Div. Animal Hlth. Personal communication. 1983.6. Doherty, R.L., et al. 1979. Aust. J. Exp. Biol. Med. Sci. 57:509-520.

Remarks
