

Virus Name: Ross River		Abbreviation: RRV
Status Arbovirus	Select Agent No	SALS Level 2
SALS Basis Results of SALS surveys and information from the Catalogue.		
Other Information		
Antigenic Group A		

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation T48	Accession Number	Original Date Submitted 1/5/1985
Family Togaviridae	Genus Alphavirus	
Information From R.L. Doherty	Address Queensland Institute of Medical Research, Herston N9, Brisbane, Australia	
Information Footnote Reviewed by editor		

Section II - Original Source

Isolated By (name) R.L. Doherty, et al. (1)	Isolated at Institute Brisbane	
Host Genus Aedes vigilax	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 Aspirated from man; light trap; resting sites	Collection Date 2/1/1959	
Place Collected (Minimum of City, State, Country) Townsville, Queensland, Australia		
Latitude 19° 41' S	Longitude 146° 51' E	
Macrohabitat East coastal plain of Queensland	Microhabitat In mangroves along the Ross River	Method of Storage until Inoculated Deep freeze at -15dC for 10 days; dry ice or Revco subsequently
Footnotes		

Section III - Method of Isolation

Inoculation Date
5/15/1963

Animal (Details will be in Section 6)
nb mice

Route Inoculated Intracerebral	Reisolation Yes
--	---------------------------

Other Reasons

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)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform) 1:400	After Treatment Titer <2 dex	Control Titer 5.2 dex
Lipid Solvent (deoxycholate)	After Treatment Titer	Control Titer

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions 40-50 nm	
Mean nm	Range nm	
Measurement Method Electron microscopy (5)	Surface Projections/Envelope Envelope present	Nucleocapsid Dimensions, Symmetry 30nm nucleocapsid

Bebaru (AMM2354)	<10/160	<8/64	2.4/>4.6
Sindbis (MRM39)	<10/160	8/64	1.0/>4.6
Sagiyama (A588)	40/320		

Relationships by HI with other Group A viruses are shown in the table below:

Serum	Antigen		
	T48	Mayaro	Semliki
T48	5120	40	80
Mayaro	5120	20480 or +	
Semliki	2560		20480 or +

Serum titers: 4-8 units of antigen.

By permission of the Director, Rockefeller Foundation Virus Laboratory. 1963.

SIRACA virus considers Ross River virus to be a subtype of Getah virus [23].

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
 Blood (M)(LV), heart (LV)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
 Newborn 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)			CPE			Plaques (9)		
BHK-21 (CL)	MB 3	1	4+	8.8* (10)				
Vero (CL)	MB 9				2	10 mm	7.0* (11)	
LLC-MK2 (CL)					5	11 mm	6.2 (11)	

* Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
<i>Aedes vigilax</i>	1/9 pools (687 mosquitoes)		Townsville, Australia; 1959
<i>Aedes normanensis</i>	1		West N.S.W., Australia (21)
<i>Culex annulirostris</i>	3/12,667		Mitchell River, Australia; 1967-1968(7)
<i>Aedes vigilax</i> , <i>Culex</i> spp.	11		Nelson Bay, N.S.W., Australia (14)
<i>Grallina cyanoleuca</i> (bird)	1/9		Mitchell River, Australia; 1965 (6)
<i>Microeca fascinans</i> (bird)	1/9		
<i>Wallabia agilis</i>	2/150		Mitchell River, Australia; 1968 (7)
Man (blood)	1		Queensland, Australia; (15)
<i>Anopheles amictus</i>	1		Charleville, Kowanyama Australia (21)
<i>Mansonia uniformis</i>	1		
Man (serum)	1		American Samoa (20)
Man		44%/393 NT	
Dogs		20%/45 NT	
Pigs		13%/27 NT	
Horses		42/53 * HI	No. Victoria, Australia (22)
Horses		18/25 HI	

Antibody reacting to Ross River virus appears to be widespread in mammals in Queensland but rare (and of doubtful significance) in birds (4,7,8). Group A antibody in sera from patients with epidemic polyarthritis react by HI and CF to RR more frequently and to higher titer than to Getah, Bebaru or Sindbis (1,2).

* Horses clinically affected with an equine nervous disease (22).

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 log ₁₀ /ml	
Mice (nb)	SM 4		ic 0.01	Death	3	7.9	
Mice (nb)			ip 0.03	Death	3-4	8.0	
Mice (nb)				sc			
Mice (wn)				ic 0.03	No deaths at 10-2 dilution		
Mice (wn)				ip 0.03	No deaths; antibody formation		
sheep		SM 25		6.2 LD ₅₀	Low viremia (18)		
pigs (4 wk)	SM 85			Viremia (18)			
rabbits, rats, bandicoots, marsupial, mice, day-old chicks				Viremia (12)			
Adult fowl, pigeons				None (12)			

Section IX - Experimental Arthropod Infection and Transmission

Arthropod species & virus source(a)	Method of Infection log ₁₀ /ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log ₁₀ /ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Culex quinquefasciatus	Intrathoracic inoculation; virus titrated by inoculation of suckling mice; 3.5/mosq. at 25 days(3).								
	Infected by membrane feeding, subsequent transmission by feeding (19).								

Section X - Histopathology

Character of lesions (specify host)

sm, ic: late thinning of cerebral cortex, muscle necrosis, lesions in brown fat; myocardial necrosis. Necrosis of ependymal cells, hydrocephalus (16,17).

Inclusion Bodies

Intranuclear

Organs/Tissues Affected

Brain (LV), heart (LV)

Category of tropism

Section XI - Human Disease

In Nature

Residual

Death

Significant

Subclinical

Overt Disease

Clinical Manifestations

Fever(S), headache(S), arthralgia(S), rash (S),lymphadenopathy (S)

Number of Cases

More than 100 (2,13)**

Category (i.e. febrile illness, etc.)

Febrile illness with rash

Section XII - Geographic Distribution

Known (Virus detected)

Australia; American Samoa (20)

Suspected (Antibody only detected)

Tasmania (23), Sepik District, New Guinea (14).

Section XIII - References

1. Doherty, R.L., et al. 1963. Aust. J. Sci. 26:183-184.
2. Doherty, R.L., et al. 1964. Aust. Ann. Med. 13:322-327.
3. Standfast, H.A. and Carley, J.G. Personal communication. 1963.
4. Doherty, R.L., et al. 1966. Aust. J. Exp. Biol. Med. Sci. 44:365-378.
5. Holmes, I.H. Personal communication. 1971.
6. Whitehead, R.H., et al. 1968. Trans. R. Soc. Trop. Med. Hyg. 62:439-445.
7. Doherty, R.L., et al. 1971. Trans. R. Soc. Trop. Med. Hyg. 65:504-513.
8. Sanderson, C.G. 1969. Am. J. Trop. Med. Hyg. 18:433-439.
9. Queensland Inst. Med. Res. Unpublished observations.
10. Karabatsos, N. and Buckley, S.J. 1967. Am. J. Trop. Med. Hyg. 16:99-105.
11. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
12. Whitehead, R.H. 1969. Aust. J. Exp. Biol. Med. Sci. 47:11-15.
13. Doherty, R.L., et al. 1971. Med. J. Aust. 1:5-8.
14. Marshall, I.D. Personal communication. 1971.
15. Doherty, R.L., et al. 1972. Med. J. Aust. May 20, 1083-1084.
16. Mims, C.A., et al. 1973. J. Infect. Dis. 127:121-128.
17. Murphy, F.A., et al. 1973. Ibid. 129-138.
18. Spradbrow, P.B. 1973. Aust. Vet. J. 49:403-404.
19. Queensland Inst. Med. Res. Unpublished data.
20. Tesh, R.B., et al. 1981. Trans. R. Soc. Trop. Med. Hyg. 75:426-431.
21. Doherty, R.L. 1977. Aust. J. Exp. Biol. and Med. Sci. 55:103-130.
22. Badman, R.T., et al. 1984 Commun. Diseases Intelligence. No. 84/17. pp.5-6
23. Marshall, I.D. 1984. Unpublished data.

Remarks

**** Accumulated serological evidence firmly relates Ross River virus to epidemic polyarthritis in Australia.**