Virus Name: Mayaro	Abbreviation: MAYV

Status
Arbovirus

Select Agent
No

SALS Level
3

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
TRVL 4675

Accession Number

Original Date Submitted
1/24/1985

Family
Togaviridae

Genus
Alphavirus

Information From
Trinidad Regional Virus Laboratory

Address
P.O. Box 164, Port of Spain

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
C.R. Anderson, et al. (1)

Isolated at Institute
TRVL, Port of Spain

Host Genus
Man

Species

Host Age/Stage
24 years

Sex
Male

Isolated From	Isolation Details
Serum/Plasma	

Signs and Symptoms of Illness
Fever, day after bleeding

Arthropod

Time Held Alive before Inoculation

Collection Method
Venipuncture

Collection Date
8/23/1954

Place Collected (Minimum of City, State, Country)
Mayaro County, southeastern Trinidad

Latitude
10° 12' N

Longitude
61° 12' W

Macrohabitat
Cat's Hill; oil worker's camp

Microhabitat
Evergreen seasonal forest

Method of Storage until Inoculated
Wet ice

Footnotes

Section III - Method of Isolation

Inoculation Date
8/23/1954

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used
HI, NT

Footnotes

Section IV - Virus Properties

Physicochemical
RNA

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)	After Treatment Titer	Control Titer

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **40 + 5 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (2)**	Surface Projections/Envelope	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; serum ext. by sucrose-acetone (5); acetone-ether (4)**	**Goose**
pH Range	pH Optimum	
6.0-6.8	**6.4**	
Temperature Range	Temperature Optimum	
4dC - 37dC	**4dC**	

Remarks

Serologic Methods Recommended
HI, CF, NT

Footnotes

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

Mayaro virus falls into Group A. For details on relationship to a number of other viruses in this group see [4] , [20] - [24] . Among those to which it was compared, it resembles Semliki Forest virus most closely. By HI, Casals [10] found Uruma indistinguishable from Mayaro. However, Schmidt, et al. [11] found differences by both HI and CF between Mayaro and Uruma and regarded them as distinct viruses.
NOTE: Uruma virus is now considered to be a strain of the Mayaro virus, and its registrations has been withdrawn [19] .

SIRACA has antigenically classified Mayaro virus and placed it in the Semliki Forest complex of serogroup A. Una virus was classified as a subtype of Mayaro virus [24] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
vero cell cultures (1)

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)	
Hamster kidney(PC)		4	CPE						
BHK-21(CL)		16hrs	CPE			Plaques (12)			
Chick embryo (PC)	BeH 407					Plaques	6.6* (14)		
Mouse embryo(PC)						Plaques	6.4 (14)		
HeLa(CL)	TRVL 4675 MB 6		CPE	8.0** (15)					
Vero(CL)	TRVL 15537					Plaques	8.2 (16)		

** 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
Man	5/2,500	60/615 NT	Trinidad (1, 8)
Man	11	53/551 NT	Belem, Brazil (6, 7)
Man	1		Lab. infection Belem, Brazil (7)
Man		119/218 NT	Guyana (8)
Man	2		Uruma, Bolivia (18)

Monkeys		17/60 NT	Trinidad
Tamarin, Pithecia, Cebus		7/21 HI	Amazon Forest, Brazil(7)
Rodents, wild		59/903 HI	Utinga Forest, Brazil(7)
Rodents, wild		12/57 HI	Amazon Forest, Brazil(7)
Opossum		7/112 HI	Utinga Forest, Brazil(7)
Opossum		2/10 HI	Amazon Forest, Brazil(7)
Bradypus		1/3 HI	Utinga Forest, Brazil
Ameiva ameiva ameiva	1		Utinga Forest, Brazil(7)
Tropidurus torquatus hispidus	1	2/9 HI	
Marmosa		7/46 HI	
Mansonia venezuelensis	1		Rio Grande Forest, Trinidad
Haemagogus spp.	25		Brasilia Highway, Brazil (7)
Culex spp.	1		IAN Forest, Brazil (7)
Sabethini spp.	2		Brasilia Highway, Brazil (7)
Psorophora spp.	4		Colombia (17)
Gigantolaelaps sp.	1		Brasilia Highway, Brazil (7)
Columbigallina		34/119 HI	Amazon Forest, Brazil(7)
Callithrix sp. (blood)	1		Brazil (27)

Two viruses isolated from mosquitoes collected on Hainan Island, Chinca during 1985 were determined to be closely related to Mayaro virus (28).

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-0	ic 0.02	Death	4-8	
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	P-1	ic 0.03	No illness or death		
Mice (wn)		ip			
Mice (nb)	P-45	ic 0.02	Death	2-3	6
Mice (14 day)	P-89	ic 0.03	Death	7-8	
embryonated egg (7 day)	P-10	ys	Death	2-4	
"" (10 day)		am.s.	Death in 3/4	4-6	

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
Aedes scapularis, Ae serratus, Culex quinquefasciatus, Mansonia arribalzagai, Ma venezuelensis, Ma wilsoni, and Psorophora ferox: inoculated parenterally with 4th passage virus,harbored the virus for about 12 days; only Ae scapularis transmitted the virus to chick by bite. (9)									
Aedes aegypti and Anopheles quadrimaculatus: virus multiples readily in these mosquitoes (1).									

Section X - Histopathology

Character of lesions (specify host)
Mice: perichondrial, periosteal, subcutaneous, tendon sheath, cardiac and pulmonary interstitial and perivascular connective tissue lesions, and moderate damage to dental pulp (L.B. Dias).

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature	Residual	Death
		Significant
Subclinical	Overt Disease	
	Reported	

Clinical Manifestations

Number of Cases
17; epidemic in Uruma colony, Bolivia (18)

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

Section XII - Geographic Distribution

Known (Virus detected)
Trinidad (1), Surinam (13), Brazil (6), Colombia (17), Bolivia(18)

Suspected (Antibody only detected)
Venezuela (25), Guyana (26)

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Remarks