Virus Name: Matucare	Abbreviation: MATV

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
MARU 21343

Accession Number

Original Date Submitted
11/2/1984

Family
Not listed

Genus
Not listed

Information From
Gustavo Justines

Address
Middle America Research Unit, Box 2011, Balboa Heights, Canal Zone

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Gustavo Justines (1)

Isolated at Institute
Providenica, San Joaquin area, Bolivia

Host Genus
Ornithodoros boliviensis, pool of 15 ticks (2)

Species

Host Age/Stage
Adults

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
By hand from walls and floors of a house

Collection Date
9/3/1963

Place Collected (Minimum of City, State, Country)
Providencia, San Joaquin area, Bolivia

Latitude
13° 0' S

Longitude
64° 30' W

Macrohabitat
Flat plain (savannah and dry forest)

Microhabitat
Adobe walls and dirt floor of house

Method of Storage until Inoculated
Kept alive until processed

Footnotes

Section III - Method of Isolation

Inoculation Date
9/4/1963

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons
Another isolate of same virus from ticks collected at same time.

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)
totally sensitive to pH 3.0 (4)

Lipid Solvent (ether - % used to test)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform) **1:10**	After Treatment Titer **1.0 dex**	Control Titer **5.5 dex**
Lipid Solvent (deoxycholate) **1:100**	After Treatment Titer **<2.0 dex**	Control Titer **5.9 dex**

Other (formalin, radiation)

Virion Morphology

Shape **Reoviridae-like (4)**	Dimensions **30-80 nm by Millipore filtration**	
Mean **63 nm**nm	Range nm	
Measurement Method **Virus passed the 100 nm membrane but not 50 nm**	Surface Projections/Envelope **No envelope. 62-64 nm**	Nucleocapsid Dimensions, Symmetry

not 30 nm

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)
No	**SMB, liver, hamster brain, liver, several passage levels ***	**Goose**
pH Range	pH Optimum	
5.6-8.0		
Temperature Range	Temperature Optimum	
4dC and 37dC		

Remarks
*** Crude alkaline, sucrose-acetone extracts and sonication plus trypsin**

Serologic Methods Recommended
NT and CF

Footnotes
*** Crude alkaline, sucrose-acetone extracts and sonication plus trypsin**

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

Hemagglutation inhibition.

Sucrose-acetone extracted mouse and hamster brain antigens were prepared and tested for hemagglutination properties according to the method of Clarke and Casals with negative results.
Complement fixation.

The sucrose-acetone extracted mouse brain was used as commplement-fixing antigen. Hyperimmune serum prepared in mice was used. Cross complement- fixations were done against polyvalent immune sera of the major groups of arbovirus that were available at the Yale Reference Center. No reactions were observed. Also, no relationship was encountered when reagents from the following viruses isolated from ticks and bats were tested:

Tick viruses			Bat viruses
Farallon	Bhanja	Quaranfil	Bukalasa bat
Chenuda	Wanowrie	Sawgrass	Dakar bat
Colorado tick fever	Johnston Atoll	Silverwater	Entebbe bat
Hughes	Kaisodi	Soldado	Kern Canyon
Dugbe	Kemerovo	Thogoto	Lagos bat
Ganjam	Lanjan	Tribec	MML
Nyamanini	Manawa	Uukuniemi	Rio Bravo
Wad Medani			

Neutralization.

Immune sera from Machupo, Junin, Tacaribe, and Amapari gave no demonstrable protection.

Indistinguishable complement-fixation reaction was found with another isolate from O. boliviensis ticks, MARU 21342.

Complement-fixation Test				Neutralization Test		
	Antibody				Antibody	
Antigen	Matucare	21342		Virus	Matucare	21342
Matucare	128/64 [a]	128/32		Matucare	1.6 [b]	1.3
MARU 21342	128/64	128/32		21342	1.9	1.8

[a] Serum titer/antigen titer

[b] Neutralizing indices in dex

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)	
Vero (CL)	Several				4-6	Plaques			
LLC-MK2 (CL)						Plaques (3)			

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
Ticks and mites: pools			
O. boliviensis	2/56		San Joaquin area, Bolivia, 1963
Ixodidae	0/87		
Trombiculidae	0/75		
Dermanyssidae	0/53		
Laelaptidae	0/49		
Siphonaptera	0/18		
Culex spp.	0/106		
Rodents:			
Calomys	0/31		
Oryzomys	0/17		
Proechimys	0/9		
Bats:			
Myotis	0/193	1/25 NT	
Noctilio	0/4	1/20 NT	
Molossus	0/55		
Eumops	0/18		
Man		0/72 NT	

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 14	ic 0.02	Neurological ill., death	3.7	7.5
Mice (nb)		ip 0.02	Neurological ill., death	6.0	
Mice (nb)		sc			
Mice (wn)		ic 0.02	Antibody		
Mice (wn)		ip 0.03	Antibody		
hamster (nb)		ic 0.02	Neurological ill., death	3.7	8.2
hamster (nb)		ip 0.02	Neurological ill., death		
hamster (wn)		ic 0.02	Antibody		
hamster (wn)		ip 0.03	Antibody		
Calomys callosus (nb)		ic 0.02	Neurological ill., death		
Calomys callosus (wn)		ic 0.02	Antibody		
Calomys callosus (wn)		ip 0.02	Antibody		

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

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)
Bolivia

Suspected (Antibody only detected)

Section XIII - References

1. Justines, G. and Kuns, M.L. 1970. Am. J. Trop. Med. and Hyg. 19:697-702.
2. Kohls, G.M. and Clifford, M.C. 1964. J. of Parasit. 50:792-796.
3. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
4. Zeller, H. et al. 1989. III. Arch. Virol. Submitted.

Remarks