Virus Name: Macaua	Abbreviation: MCAV

Status
Probable Arbovirus

Select Agent
No

SALS Level
3

SALS Basis
Isufficient experience with virus; i.e., experience factor from SALS surveys was less than 500 in laboratory facilities with low biocontainment.

Other Information

Antigenic Group
Bunyamwera

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
BeAr 306329

Accession Number

Original Date Submitted
9/13/1984

Family
Bunyavirus

Genus

Information From
F. Pinheiro and Amelia P.A.T. Rosa

Address
Instituto Evandro Chagas, FSESP, Ministry of Health, CP-621, Belem, Para, Brazil

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Gilberta Bensabath

Isolated at Institute
Instituto Evandro Chagas

Host Genus
Sabethes (Sbn) soperi, pool of 20 mosquitoes

Species

Host Age/Stage
adult

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod
Depleted

Time Held Alive before Inoculation
3 hours

Collection Method
human bait

Collection Date
4/19/1976

Place Collected (Minimum of City, State, Country)
Sena Madureira, (km. 8 Br. 364) Acre

Latitude
9° 3' S

Longitude
68° 39' W

Macrohabitat
tropical rain forest

Microhabitat
ground level

Method of Storage until Inoculated
liquid nitrogen and mechanical freezer at -60dC

Footnotes

Section III - Method of Isolation

Inoculation Date
11/3/1976

Animal (Details will be in Section 6)
nb mice

Route Inoculated
intracerebral

Reisolation
Not tried

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)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:1000**	After Treatment Titer **3.4 dex**	Control Titer **6.5 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions	
Mean nm	Range nm	
Measurement Method	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 ext. by sucrose-acetone + sonication**	**goose**
pH Range	pH Optimum	
5.8-7.0	**6.0**	
Temperature Range	Temperature Optimum	
room, 37dC	**room**	

Remarks

Serologic Methods Recommended
HI, CF, and NT

Footnotes

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

CF tests performed in Belem showed that Macaua virus shares an antigenic relationship with viruses of the Bunyamwera group.

Complement-Fixation Test

	Sera							
Antigens	**Macaua**	**Iaco**	**BeAr 328208**	**Tucunduba**	**MAG**	**KRI**	**GRO**	**SOR**
Macaua	256/>256 [b]	16/>=256	0	0	0	0	0	16/>256
Iaco	8/>=256	>=256/>=256						
BeAr 328208	8/32		64/64					
Tucunduba	16/>=256			64/>=256				
Maguari	0				>=32/>=40			
Kairi	0					16/>=64		
Guaroa	0						>=32/>=40	
Sororoca	8/64							256/>=256

[b] Serum titer/antigen titer; 0 = <4/<4

PRNT in Vero cells [1]

Virus	Sera											
	Macaua	Iaco	BeAr 328208	Tucunduba	Taiassui	SOR	BAT	NOR	AMB	BUN	BIR	SHO
Macaua	128 [c]	8	<8	<8	16	<8	<8	8	8	<8	8	<8
Iaco	8	2048										
BeAr 328208	16		128									
Tucunduba				64								
Taiassui	16				512							
Sororoca						64-128						

[c] Reciprocal of highest dilution giving 80% plaque reduction

At YARU, Macaua CF antigen did not react with hyperimmune sera of Germiston, Ilesha, Lokern, Main Drain, Tensaw, Tlacotalpan and Playas viruses. Antigenic relationship was demonstrated with Batai, Northway, Anhembi, Bunyamwera, Santa Rosa, Birao, and Shokwe viruses. Sera of these viruses did not neutralize Macaua virus by PRNT in Vero cell cultures [1] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (M), heart (LV), CNS (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	
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	+/- (g)	
Vero (CL)	SMB 3	4-5	4+	8.0*	7	2-3mm	7.0*		

* 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
Sabethes (Sbn) soperi	2/4,531		Sena Madureira, Acre, Brazil
Other Culicidae	3/162,461 *		
Phlebotomines (female)	0/796		
Phlebotomines (male)	0/799		
Proechimys (organs)	1/507		
Other rodents	0/438		
Wild birds (blood)	2/2,812 **		C. Porteira, Para, Brazil; 1976-79
Mosquitoes (female)	0/56,523		
Mosquitoes (male)	0/8,693		
Man		1/84 HI	Jacunda, Para, Brazil
Man		0/37 HI	Itupiranga, Para, Brazil
Marsupials		0/42 HI	C. Porteira, Para, Brazil; 1977
Rodents		0/99 HI	
Primates		0/23 HI	
Edentate		0/1 HI	
Carnivores		0/4 HI	
Ungulates		0/9 HI	
Reptiles		0/5 HI	
Bats		0/5 HI	
Wild birds		0/387 HI	
Primates		0/7 HI	Alenquer, Para, Brazil

Macaua virus was not isolated from blood or viscera of the following animals captured in Sena Madureira: 252 marsupials, 17 primates, 1 edentate, 63 bats, 173 reptiles, 617 wild birds, and 680 domestic birds.

* Isolated from Wyeomyia spp.

** Isolated from Hylophylax poecilonota (scale-backed antibird) and Platyrinchus coronatus (golden-crowned spadebill).

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 4	ic 0.02	illness, death	4.0	8.0
mice (nb)		ip 0.02	illness, death	6.2	
mice (nb)		sc			
mice (wn)		ic 0.03	irregular deaths		
mice (wn)		ip 0.03	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)

Suspected (Antibody only detected)

Section XIII - References

1. Shope, R.E. Personal communication. 1981.

Remarks