Virus Name: Mermet	Abbreviation: MERV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Results of SALS surveys and information from the Catalogue.

Other Information

Antigenic Group
Simbu

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
AV-782

Accession Number

Original Date Submitted
11/2/1984

Family
Bunyaviridae

Genus
Bunyavirus

Information From
Arbovirology Unit

Address
Centers for Disease Control, Atlanta, Georgia 30333, USA

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
R.H. Kokernot

Isolated at Institute
Urbana, Illinois

Host Genus
Progne subis (purple martin)

Species

Host Age/Stage

Sex
Not Answered

Isolated From	Isolation Details
Whole Blood	

Signs and Symptoms of Illness
None

Arthropod

Time Held Alive before Inoculation

Collection Method
Mist net

Collection Date
7/27/1964

Place Collected (Minimum of City, State, Country)
Metropolis, Massac Co., Illinois

Latitude
37° 11' N

Longitude
88° 45' W

Macrohabitat
Brushy area between village and Ohio River

Microhabitat

Method of Storage until Inoculated
Solid CO2, then Revco at -70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
8/10/1964

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Not tried

Other Reasons

Homologous Antibody Formation by Source Animal
Not tested

Test(s) Used

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) **1:200**	After Treatment Titer **2.3 dex**	Control Titer **7.0 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**	**Goose**
pH Range	pH Optimum	
5.8-6.8	**6.2**	
Temperature Range	Temperature Optimum	
4dC - 37dC	**37dC**	

Remarks
HA antigen produced in low titer and obtained only with unlyophilized sucrose-acetone antigen * Determined with BUDR using vaccinia and WEE as controls in Vero cell cultures

Serologic Methods Recommended
CF, NT, HI

Footnotes
HA antigen produced in low titer and obtained only with unlyophilized sucrose-acetone antigen * Determined with BUDR using vaccinia and WEE as controls in Vero cell cultures

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

HA antigen not inhibited by immune serum or ascitic fluid to the following: arboviruses of groups A, B, C, Guama, Bunyamwera, California, and Turlock as well as Sicilian Sandfly fever, Flanders, Silverwater and Colorado tick fever. In addition, no inhibition of HA was demonstrated with immune ascitic fluids to groups A, C, California, Bunyamwera and Pahayokee-Shark River-Gumbo Limbo (Broad).
CF antigen of AV-782 did not react with immune serum or ascitic fluid to Flanders, yellow fever, St. Louis encephalitis, La Crosse virus, EEE, WEE, Highlands J, Silverwater, Powassan, Tensaw, Colorado tick fever, Turlock, VSNJ, VSI, Cocal, Cowbone Ridge, Tamiami, Anopheles A, Shark River, Pahayokee, trivittatus, Gumbo Limbo, Sawgrass, Newcastle disease virus, encephalomyocar- ditis, mouse hepatitis, mouse adenovirus, LCM and vaccinia. In addition, immune ascitic fluids to broad groups A, B, C, Guama, Bunyamwera, Capim, Phlebotomus fever, and California failed to react with AV-782 antigen.
IP neutralization tests in suckling mice using another strain of Mermet virus and immune serum to the following did not give evidence of protection: Tensaw, Colorado tick fever, Powassan, Rio Bravo, Modoc, TMA-1381, Kern Canyon, AR-531, CE, EEE, WEE, SLE, Turlock, Flanders, Hart Park and AR-4242.

Cross Reactivities of Mermet (Strain AV-782) Virus with Simbu Group Members (Ht/Ho)

Registered Virus	Mermet Immune Ascitic Fluid			Mermet Antigen		
	CF	NT	HI	CF	NT	HI
Oropouche	128/>1024	/4.3		0/32	1.1/3.0	
Sathuperi	8/>1024	>1.3/4.3		0/128	0.3/>6.0	
Buttonwillow	32/>1024	2.7/4.3		0/64	3.5/3.2	
Utinga	64/>1024	1.4/4.3		0/16	1.6/2.3	
Akabane	16/>1024	0/4.3		0/128	0.6/>4.8	
Ingwavuma	512/>1024	>5.5/4.3	20/>1280	512/32	2.8/3.8	10/60
Simbu	8/>1024	0.5/4.3		0/16	1.3/2.5	
Manzanilla	>1024/>1024	>3.9/4.3	40/>1280	16/64	3.6/>3.9	10/80
Mermet	>1024	4.3	>1280	>1024	4.3	>1280

Mermet virus was shown to be closely related to Ingwavuma and Inini viruses; all three viruses were considered to be subtypes of Manzanilla virus [4] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
salivary glands (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)	
BHK-21 (CL)	SMB6 TC4		CPE		3	Plaques	7.6*		
Rabbit kidney (CL)			CPE		3	Plaques	7.3		
Vero (CL)			CPE		3	Plaques	7.0		
Duck embryo (PC)			CPE		3	Plaques	5.9		

* 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
Progne subis subis	1		S. Illinois, July 1964
Cyanocitta cristata cristata	1		S. Illinois, Sept. 1964
Hylocichla ustulata swainsoni	1		S. Illinois, Sept. 1965
Agelaius phoeniceus phoeniceus	1		S. Illinois, May 1964
Richmondena cardinalis (cardinal)	1/48		Dallas, Texas, August 1966
Other wild birds	0/632		Dallas, Texas, Aug.-Sept. 1966
Culex restuans	1		Memphis, Tennessee(3)
Culex pipiens	1		

NT antibody found in wild birds (3,198 tested) collected in Texas, Mississippi, Tennessee, Ohio, Indiana, Illnois and Wisconsin; not in those collected in Kentucky and Missouri (2).

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)	SMB6 TC4	ic 0.02	Death	3	7.9
Mice (nb)		ip 0.03	Death	3-4	6.9
Mice (nb)		sc			
Mice (wn)		ic 0.02	Death	8	7.1
Mice (wn)		ip 0.03	Death	8	6.1
Mice (8 wk)		ic 0.02	Antibody		
Mice (8 wk)		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)
The only specific findings were in the brain: nonfocal, general increasing glial cells and neuronal degeneration -necrotizing encephalitis. Not a remarkable meningitic or perivascular reaction (suckling mice).

Inclusion Bodies — Intranuclear

Organs/Tissues Affected
Brain (LV)

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)
Colorado; Illinois; Tennessee; Texas,USA

Suspected (Antibody only detected)
Mississippi, Tennessee, Ohio, Indiana, Wisconsin (2)

Section XIII - References

1. Calisher, C.H., et al. 1969. Am. J. Trop. Med. and Hyg. 18:779-788.
2. Calisher, C.H., et al. 1981. Am. J. Trop. Med. and Hyg. 30:473-476.
3. Jakob, W.L., et al. 1971. J. Med. Ent. 16:80-81
4. Kinney, R.M. and Calisher, C.H. 1981. Am. J. Trop. Med. Hyg. 30:1307-1318.

Remarks