

<b>Virus Name: Malakal</b>		<b>Abbreviation: MALV</b>
Status <b>Possible Arbovirus</b>	Select Agent <b>No</b>	SALS Level <b>2</b>
SALS Basis <b>Results of SALS surveys and information from the Catalogue.</b>		
Other Information		
Antigenic Group <b>Malakal</b>		

**SECTION I - Full Virus Name and Prototype Number**

Prototype Strain Number / Designation <b>SudAr 1169-64</b>	Accession Number	Original Date Submitted <b>8/22/1984</b>
Family <b>Not listed</b>	Genus <b>Not listed</b>	
Information From <b>J.R. Schmidt</b>	Address <b>Bur. of Medicine and Surgery, Dept. of Navy, Washington, D.C., USA</b>	
Information Footnote <b>Reviewed by editor</b>		

**Section II - Original Source**

Isolated By (name) <b>J.R. Schmidt</b>	Isolated at Institute <b>U.S. NAMRU-3, Cairo, Egypt</b>	
Host Genus <b>Pool of 100 <i>Mansonia uniformis</i></b>	Species	Host Age/Stage <b>Adult</b>
Sex <b>Female</b>		
<u>Isolated From</u>	<u>Isolation Details</u>	
Signs and Symptoms of Illness	Arthropod	
Time Held Alive before Inoculation		
Collection Method <b>Aspirated from human bait</b>	Collection Date <b>7/25/1963</b>	
Place Collected (Minimum of City, State, Country) <b>2 mi. N. of Malakal, Upper Nile Prov., Sudan</b>		
Latitude <b>9° N</b>	Longitude <b>31° E</b>	
Macrohabitat <b>Along bank of Nile River</b>	Microhabitat	Method of Storage until Inoculated <b>-20dC for 2 mos; -60dC thereafter</b>
Footnotes		

**Section III - Method of Isolation**

Inoculation Date  
**3/17/1964**

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) <b>Undiluted</b>	After Treatment Titer <b>2.5 dex</b>	Control Titer <b>6.6 dex</b>
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) <b>1:500</b>	After Treatment Titer <b>3.9 dex</b>	Control Titer <b>6.3 dex</b>
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

Hemagglutination

Antigen Source

Erythrocytes (species used)

No

SMB ext. by sucrose-acetone

Goose

pH Range

pH Optimum

5.8-7.3

Temperature Range

Temperature Optimum

4dC-37dC

Remarks

Serologic Methods Recommended

CF, NT

Footnotes

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

Malakal hyperimmune mouse serum tested by CF with 197 antigens of arboviruses and other viral pathogens of mice with negative results except for Puchong (P5-350) antigen. CF relationship with Puchong was as follows:

Antigen	Puchong Serum	Malakal Mouse Ascitic fluid
Puchong	64/256 *	128/64
Malakal	8/128	> 512/256
Normal	0/0	8/4

\* Antibody titer/antigen titer

These tests were done at the Yale Arbovirus Research Unit. Malakal and Puchong viruses form a serogroup. In cross-neutralization tests the 2 viruses are distinct (see Puchong virus registration).

Malakal hyperimmune serum was negative in HI tests with 19 antigens and negative in CF tests with 33 viruses indigenous to Africa [1].

**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							Growth Without CPE +/- (g)
		CPE			PLAQUES				
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)		

**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
Mansonia uniformis	4/91,639		Malakal, Sudan

**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 <sub>10</sub> /ml
Mice (nb)	SMB 7	ic 0.01	Death	3*	8.5
Mice (nb)		ip 0.03			2.5
Mice (nb)		sc			
Mice (wn)		ic 0.03			3.5
Mice (wn)		ip 0.03			2.5

\* at 10<sup>-3</sup> dilution

**Section IX - Experimental Arthropod Infection and Transmission**

Arthropod species & virus source(a)	Method of Infection log <sub>10</sub> /ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log <sub>10</sub> /ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Aedes aegypti	Fed on mouse brain suspension containing 1.9 dex LD <sub>50</sub> . No virus recovered 20 days later.								

**Section X - Histopathology**

Character of lesions (specify host)		
<u>Inclusion Bodies</u>	<u>Intranuclear</u>	
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) <b>Sudan (1)</b>
Suspected (Antibody only detected)

**Section XIII - References**

1. Schmidt, J.R., et al. 1965. E. Afr. Virus Res. Inst. Rep. No. 15. pp. 24-25.
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**Remarks**

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