

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

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

Prototype Strain Number / Designation <b>SAAr 1776</b>	Accession Number	Original Date Submitted 3/2/1984
Family <b>Flaviviridae</b>	Genus <b>Flavivirus</b>	
Information From <b>B.M. McIntosh</b>	Address <b>National Institute for Virology, P/Bag X4, Sandringham, 2131, South Africa</b>	
Information Footnote <b>Revised</b>		

#### Section II - Original Source

Isolated By (name) <b>B.M. McIntosh</b>	Isolated at Institute <b>S.Afr.Inst. for Med. Res.,Johannesburg</b>	
Host Genus <b>Culex neavei</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 <b>Arthropod</b>		
Time Held Alive before Inoculation <b>A few hours</b>		
Collection Method <b>By hand off vegetation</b>	Collection Date <b>1/30/1959</b>	
Place Collected (Minimum of City, State, Country) <b>Ndumu, Natal, South Africa</b>		
Latitude <b>27° 0' S</b>	Longitude <b>32° 0' E</b>	
Macrohabitat <b>Tropical, coastal lowland, savannah woodland</b>	Microhabitat	Method of Storage until Inoculated <b>Solid CO2</b>
Footnotes		

### **Section III - Method of Isolation**

Inoculation Date  
2/6/1959

Animal (Details will be in Section 6)  
**nb mice**

Route Inoculated Reisolation  
Intracerebral No

**Other Reasons**  
**A virus antigenically unique to the laboratory**

### 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

## 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

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)
Yes	SMB ext. by sucrose-acetone	Goose
pH Range	pH Optimum	
6.3-6.6	6.4	
Temperature Range	Temperature Optimum	
Remarks		
Serologic Methods Recommended		
HI, CF, NT		
Footnotes		

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

Antigens or HIAF	USU Antigen	USU HIAF
	CF (1)	CF (1)
Bagaza	8	8
Ntaya	32	16
West Nile	8	2
Koutango	8	8
Banzi	>256	16
Uganda S	64	64
Bouboui	64	16
Saboya	>128	32
Spondweni	>1024	16
Zika	32	64
Wesselsbron	32	32
Dengue 1	64	32

Yellow fever	>128	64
Dakar bat	>64	64

CF: results expressed as quotient of homologous/heterologous titers

In cross PRNT with 42 flaviviruses, USU virus reacted only with 4 viruses as follows [2] :

Viruses orAntisera	USU Virus	USU Antibody
	PRNT	PRNT
Japanese Enc.	320/160	40/<20
Murray Valley Enc.	80/80	40/320
West Nile	1280/80	40/40
Alfuy	40/<20	40/80

PRNT: results = homologous/heterologous titers

USU virus is a member of the West Nile serological subgroup [2], [3].

## Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)  
BHK-21 cell cultures

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)				
Vero (CL)	MB 7				2	10 mm	8.* (4)				
LLC-MK2 (CL)					7	2 mm	7.5 (4)				
PS (CL)	MB 8				3-4	4 mm	8.0 (5)				

\* 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		0/198 NT	S. Africa; Mozambique (1)
Cattle and sheep		1/262 NT	S. Africa (1)
Praomys spp. (rodent)	1		Central African Republic (6)
Birds:			
Bycanistes sharpei	2		
Andropadus virens	1		
Turdus libonyanus	1		Nigeria (7)
Culex neavei	1		Natal, S. Africa (1)
Coquillettidia aurites	1		Uganda (8)
Culex spp.	1		Lunyo Forest, Uganda (9)
Culex perfuscus	1		Senegal (10, 6)
4 mosquito species	4		Cameroun (6)
6 mosquito species	6		Central African Republic (6)
Man (serum)	1		Central African Republic (13)

## 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)	Ar 1776	ic 0.03	Death	5-6		
Mice (nb)		ip				
Mice (nb)		sc				
Mice (wn)		ic 0.03	Death	6-7	8.4	
Mice (wn)		ip				
guinea pig (ad)		ic 0.2	Antibody			
Arvicantis abyssinicus	Strain unk.	ip 7.2 dex	Trace of viremia, days 1-2; NT antibody prod. (11)			

## 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
Culex neavei	6.0		14	26	hamster	14 mosq. failed to transmit	2/10 mosquitoes were infected on 14th day		

## Section X - Histopathology

Character of lesions (specify host)

Inclusion Bodies

Intranuclear

Organs/Tissues Affected

Category of tropism

## Section XI - Human Disease

In Nature Reported	Residual	Death
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Subclinical	Overt Disease
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Clinical Manifestations

Number of Cases <b>1</b>	Category (i.e. febrile illness, etc.) <b>Febrile illness with rash</b>
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## Section XII - Geographic Distribution

Known (Virus detected)

**South Africa (1), Uganda (8,9), Nigeria (7), Central African Republic (6, 13) Senegal (10), Cameroun (6)**

Suspected (Antibody only detected)

## Section XIII - References

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6. Rapport Annuel de l'Institut Pasteur de Dakar. 1980.
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9. Henderson, B.E., et al. 1972. Ann. Trop. Med. Parasitol. 66:343-355.
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12. Jupp, P.G. 1971. J. Ent. Soc. S. Africa 34:339-357.
13. Rapport Annuel Du Centre Collaborateur OMS De Reference Et De Recherche Pour Les Arboviruses. Institut Pasteur, Dakar. 1983.

## Remarks

Since the original registration of USU virus, the taxon of the arthropod source of AR 1776 was altered from *Culex univittatus* to *Culex neavei* as a result of taxonomic revision (12). Isolations reported from Cameroun and Central African Republic are apparently a serologic variant, S-t Y 276 (6).