Virus Name: Dugbe	Abbreviation: DUGV

Status
Probable Arbovirus

Select Agent
No

SALS Level
3

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

Other Information

Antigenic Group
Nairobi Sheep Disease

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
AR1792

Accession Number

Original Date Submitted
11/5/1984

Family
Bunyaviridae

Genus
Nairovirus

Information From
O.R. Causey

Address
University of Ibadan, Ibadan, Nigeria

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Virus Research Lab

Isolated at Institute
University of Ibadan, Nigeria

Host Genus
Amblyomma variegatum

Species

Host Age/Stage
Adult

Sex
Male

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
Picked by hand from cattle

Collection Date
10/14/1964

Place Collected (Minimum of City, State, Country)
Ibadan, Nigeria

Latitude
7° 20' N

Longitude
3° 50' E

Macrohabitat
Between Guinea woodland and rain forest vegetation zones

Microhabitat
White Fulani cattle at cattle market

Method of Storage until Inoculated
Revco at -70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
10/16/1964

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation

Other Reasons
Numerous isolationsfrom tick pools and cattle blood and specific antibody in associated animals

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) **1:100**	After Treatment Titer **<1.5 dex**	Control Titer **5.9 dex**
Lipid Solvent (deoxycholate) **1:1000**	After Treatment Titer **3.5 dex**	Control Titer **7.4 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **90-100 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (10)**	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 **6.6**	
Temperature Range **37dC**	Temperature Optimum	

Remarks
***HA produced in low titer from AR2484 another strain of Dugbe virus.**

Serologic Methods Recommended
CF, NT

Footnotes
***HA produced in low titer from AR2484 another strain of Dugbe virus.**

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

Screening of antigen AR1792 gave negative results in complement fixation test at YARU with the following hyperimmune fluids fromm mice in 1:4 dilution:

Group A, polyvalent	Nyamanini (EgAr 1304)	Group B, polyvalent
Oropouche (Tr 9760)	California group	Quaranfil (EgAr 1095)
California Enc. (BFS 283)	Silverwater (M 3737)	Calovo (K 184)
Simbu (SaAr 53)	Chenuda (EgAr 1152)	Tacaiuma (BeAn 73)
Colorado tick fever (Condon)	Tacaribe (Tr 11573)	Eretmapodites 147
Thogoto (II A)	Guaroa (CoH 35211)	Turlock (Len 847-32)
Hughes (Dry Tortugas)	Congo (UG 3010)	Ganjam (IG 619)
Uukuniemi (JA 21)	Wad Medani (IG 673 and EgAr 492)	Wyeomyia (Roca-Garcia)
Bhanja (IG 690)	Dugbe (IbAr 1792)	Ilesha (KO 2)
Kemerovo (32-K)	Kairi (Cali 233)	Kowanyama (MRM 1178)
LCM (Bulgaria M2)	RUD SM 214	Manzanilla (Tr 3587)
Tribec	Mouse encephalomyelitis (GD 1)	Mouse hep. enc. (Tr 23421)

Among tick-borne viruses outside group B, Dugbe is distantly related by CF test only with Ganjam virus (IG 619) [1] .

CF Reactions with Dugbe and Ganjam Viruses

	Serum			
	Dugbe [a]		Ganjam	
Antigen	Ar 1792	Ar 1792	IG 619	IG 3159
Dugbe IbAr 1792	512/128	512/128	0	16/16+
Dugbe IbAr 2484	512/512	512/512		
Ganjam IG 619	8/8	16/8	256/32	256/32
Ganjam IG 3159	0	0		256/32
Controls	0	0		

[a] 2 different samples. Serum titer/antigen titer; 0 = <8/<8

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (M)(LV), liver (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)	
BS-C-1 (CL)			CPE (3)						
Vero (CL)			CPE (3)			Plaques (4)			
LLC-MK2 (CL)						Plaques (4)			
Duck embryo(PC)	P11 SM1				4	Plaques	7.4(b)(11)		

(b) 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	2		Central African Republic (5)
Man (febrile children)	2		Ibadan, Nigeria (5) Nigeria
Man	2/5,820	0/153 HI	Also 0/18 NT;
Cattle	164/2,199	96/331 HI	
Sheep and goat	0/643	3/81 HI	
Cricetomys gambianus (serum)	1		Bassa, Benue-Plateau Nigeria (3)
Swine	0/131	0/52 HI	
Dog and cat	0/71		

Horse	0/26		
Camel	0/3		
Insectivora	0/336		
Chiroptera	0/828		
Primate	0/64		
Lepus	0/6		
Rodentia	0/3,084		
Carnivora	0/7		
Aves	0/319		
Reptile	0/56		
Amphibia	0/3		
Mosquitoes (pools)	0/420		
Culicoides (pools)	2/462		
Ixodidae (pools)	358/4,435		
Aedes aegypti (pool, gravid)	1		Ibadan, Nigeria (3)
Amblyomma variegatum	14;3		Cent. Afr. Rep. (7);, Ethiopia (14)
Ambloyomma variegatum(pools)	106/850		Nigeria (6)
Boophilus decoloratus	48/864		
Hyalomma truncatum	67/663		
H. rufipes	2/106		
Dugbe virus isolated from eggs of Amblyomma variegatum ticks removed from animals in slaughter houses in the Cent. Afr. Rep. (16).			

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 3	ic 0.02	Paralysis and death	4-7	6.0
Mice (nb)		ip 0.02	No signs		
Mice (nb)		sc			
Mice (wn)		ic			
Mice (wn)		ip			
Mice (10 day)		ic 0.02	Paralysis and death	5-7	
Mice (10 day)		ip 0.02	No signs		

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)
Swiss mice: Mild diffuse infiltration of gray and white matter by mono- and polymorphonuclear leucocytes, with focal aggregates in basal ganglia and horn of temporal lobe. Neurons show lytic necrosis, pycnotic nuclei, neuronuphagia (2).

Inclusion Bodies — Intranuclear

Organs/Tissues Affected
Brain (LV)

Category of tropism
Acute encephalitis

Section XI - Human Disease

In Nature	Residual	Death
Reported		

Subclinical	Overt Disease
	Reported

Clinical Manifestations

Number of Cases	Category (i.e. febrile illness, etc.)
2	**Febrile illness**

Section XII - Geographic Distribution

Known (Virus detected)
Nigeria, Central African Republic. Uganda (3), Senegal (7), Ethiopia (14)

Suspected (Antibody only detected)

Section XIII - References

1. Casals, J. Personal communication.
2. David-West, T.S. 1970. Brit. J. Exper. Path. 51:332-339.
3. Moore, D.L. Personal communication. March 1971.
4. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
5. Rapport Annuel de l'Institut Pasteur de Bangui. 1969, 1970.
6. Williams, R.W., et al. 1972. J. Med. Ent. 9:443.
7. Rapport Annuel de l'Institut Pasteur de Dakar. 1973. p. 10.
8. David-West, T.S. and Porterfield, J.S. 1974. J. Gen. Virol. 23:297-307.
9. Davies, F.G. Personal communication. Nov. 1978.
10. Davies, F.G., et al. 1978. J. Comp. Path. 88:001-005.
11. Lazuick, J. Personal communication. 1979.
12. Casals, J. and Tignor, G.H. 1980. Intervirology 14:144-147.
13. Mathews, R.E.F. 1982. Intervirology 17:115-118.
14. Wood, O.L., et al. 1978. Am. J. Trop. Med. Hyg. 27:600-604.
15. The Subcommittee on Arbovirus Laboratory Safety of The American Committee on Arthropod-Borne Viruses. 1980. Am. J. Trop. Med. Hyg. 29:1359-1381.
16. Cornet, J.P., et al. 1987. Ann. Inst. Pasteur Virol. 138:169-272.

Remarks

A low-titered relationship demonstrated by CF, fluor. antibody and indirect HA between CON and NSD viruses (9,10). SIRACA has decided that these relations are no greater than those used to establish BUN Supergroup. The CON and NSD antigenic groups should be kept as two distinct serogroups. Intergroup relationships also were demonstrated for members of the DGK, HUG, QYB, and SAK serogroups as well as for members of the above-mentioned two serogroups (12). Dugbe virus has been classified as a member of the Nairovirus genus in the family Bunyaviridae (13).