

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		
<u>Isolated From</u>	<u>Isolation Details</u>	
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 isolations from 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

Hemagglutination Antigen Source Erythrocytes (species used)
Yes **SMB ext. by sucrose-acetone** **Goose**

pH Range pH Optimum
6.6

Temperature Range Temperature Optimum
37dC

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 from 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].

Antigen	CF Reactions with Dugbe and Ganjam Viruses			
	Dugbe ^a		Serum	
	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 +/- (g)
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	
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 log ₁₀ /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 log ₁₀ /ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log ₁₀ /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, pyknotic nuclei, neuronophagia (2).

Inclusion Bodies

Intranuclear

Organs/Tissues Affected

Brain (LV)

Category of tropism

Acute encephalitis

Section XI - Human Disease

In Nature
Reported

Residual

Death

Subclinical

Overt Disease
Reported

Clinical Manifestations

Number of Cases

2

Category (i.e. febrile illness, etc.)

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.
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5. Rapport Annuel de l'Institut Pasteur de Bangui. 1969, 1970.
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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.
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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).