Virus Name: Congo	Abbreviation: CONV

Status
Arbovirus

Select Agent
No

SALS Level
4

SALS Basis
Level assigned to prototype or wild-type virus. A lower level may be recommended for laboratory strains or geographic variants of the virus with well-defined reduced virulence characteristics, as mentioned in the text.

Other Information

Antigenic Group
CHF-CON

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
V 3011

Accession Number

Original Date Submitted
10/28/1984

Family
Nairovirus

Genus

Information From
B.G. Kirya, G.W. Kafuko

Address
East African Virus research Institute, Box 49, Entebbe, Uganda

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Dr. G. Courtois (1,2)

Isolated at Institute
Prov. Med. Lab., (Stanleyville) Kisangani

Host Genus
Man

Species

Host Age/Stage
13 years

Sex
Male

Isolated From	Isolation Details
Serum/Plasma	

Signs and Symptoms of Illness
fever, headache, nausea, vomiting, backache, generalized joint pains, photophobia

Arthropod

Time Held Alive before Inoculation

Collection Method
venepuncture under sterile conditions

Collection Date
3/6/1956

Place Collected (Minimum of City, State, Country)
Prov. Med. Lab. (Stanleyville) Kisangani

Latitude
0° 33' N

Longitude
25° 14' E

Macrohabitat

Microhabitat

Method of Storage until Inoculated

Footnotes

Section III - Method of Isolation

Inoculation Date
3/6/1956

Animal (Details will be in Section 6)
nb mice

Route Inoculated
ic and ip

Reisolation
Not tried

Other Reasons

Homologous Antibody Formation by Source Animal
Not tested

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) **1:1**	After Treatment Titer **<=0.5 dex**	Control Titer **2.1 dex**
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate)	After Treatment Titer	Control Titer

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **70-140 nm**	
Mean nm	Range nm	
Measurement Method **millipore membrane filtration (14)**	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 and No	**SMB ext. by sucrose-acetone; and flourocarbon (Arcton)**	**goose***
pH Range	pH Optimum	
6.8 - 7.6	**7.2 - 7.3**	
Temperature Range	Temperature Optimum	
	37dC, 1 - 1.5 hours	

Remarks

Serologic Methods Recommended
CF, NT, agar gel precipitin, virus challenge NT in

Footnotes

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

It was screened by CF at 1/5 and 1/40 against hyperimmune antisera to the following African arboviruses without finding any significant relationship:

Bunyamwera	Ingwavuma	Lebombo
Germiston	Simbu	Lumbo
Ilesha	African horsesickness	Mossuril
Olifantsvlei	Bluetongue	Orungo
Shokwe	Chenuda	Nairobi sheep disease
Bwamba	Dakar	Nyamanini
Pongola	Lagos bat	Nyando
Quaranfil	Tanga	Tete
Thogoto	Wad Medani	Witwatersrand

It was also negative with hyperimmune Herpes simmplex antiserum.

Hyperimmune antiserum (V 3011) has been screened at 1/10 by HI with negative results against the following antigens:

Group A	chikungunya, Semliki forest virus, Sindbis
Group B	yellow fever, West Nile, Zika, Banzi
Bunyamwera	(Aedes '43)

Casals [10] has shown 3 strains of Congo virus (Congo 3010, Uganda K2/61, Pakistan JD 206) to be atnigenically indistinguishable from each other and from the Drosdov strain of Crimean hemorrhagic fever (CHF) by CF tests. NT and agar gel precipitin tests confirm this relationship.
Hazara virus found to be related to but distinct from Congo virus by NT [20] and C (see HAZ registration). Also related by HI [19] .

A low-titered relationship by CF, fluorscent antibody and indirect HA demonstrated between CON and NSD viruses [23] , [24] .
SIRACA has decided that these relations are no greater than those used to establish the Bunyamwera Supergroup. The CON and NSD antigenic groups should be kept as two distinct serogroups.
Following the above observations, intergroup relationships were demonstrated for members of the above two serogroups as well as for members of the DGK, HUG, QYB and SAK serogroups [30] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
blood (M)(LV), liver (LV), liver and spleen pool (LV)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
newborn mice and weaning 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)	
LLC-MK2 (CL)	3010 SM 6 TC 1				5-7	Plaques	4.2**		
Vero (CL)						No plaques			
Vero (CL)	SM 2		No CPE	4.5**				+	
BHK-21 (CL)			No CPE	6.5				+	
Ae aegypti (CL)			No CPE					-	
Ae albopictus (CL)			No CPE					-	
LLC-MK2 (CL)	SM6 BHK 1	4	2+	8.5 (12)					

Produces persistent infection withour CPE in LLC-MK2 cells when media changed regularly. These chronically infected cells after 6-8 transfers were resistant to superinfection (plaque challenge) with Sindbis, Catu, Candiru, Chenuda, Soldado, and Congo viruses but susceptible to VS-Indiana and Cocal viruses (T. Stim. Personal Communication.)

** 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; 3	*	(Stanleyville) Kisangini, Zaire; Iraq (27)
Man	10; 1		Entebbe, Uganda; Transvaal, South Africa (28)
Man	numerous	17-587 AGD	USSR (9); Hungary (20)
Man (blood)	5		Nosocomial outbreak,

			Rawalpindi, Pakistan (26)
Cow	1		Kabete, Kenya
Cow	4/49		Ibadan, Nigeria
Goat	1		
Hedgehog (Atelerix spiculus)	1/38		Dada, Nigeria
Hyalomma rufipes	1		Ibadan, Nigeria
H. impeltatum	1		Kano, Nigeria
H. truncatum	2		Ibadan, Nigeria
H. excavatum	1		Sokoto, Nigeria
Amblyomma variegatum	1		Upper Ogun, Nigeria
Boophilus decoloratus	21		Ibadan, Nigeria
Hyalomma spp.	1		West Pakistan (16)
Hyalomma spp.	1		USSR
Culicoides spp.	1		Ibadan, Nigeria
H. truncatum	2		Senegal (15)
H. rufipes	2		
A. variegatum	1		Ankole Dist., Uganda (17)
Hyalomma nitidum	1/3 pools		Central African Republic (21)
Rhipicephalus bursa	1		Vergina, Macedonia, Greece (25)
Hyalomma impeltatum	1		Ethiopia (31)
Alveonasus laborensis (engorged larvae)	1		Iran (29)
Various animals		0/169 AGD	Hungary (22)

* Precipitating and NT antibody frequently found in sera of cattle, horses, sheep, and hares in Crimean hemorrhagic fever foci (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)	SMB 35	ic 0.03	paralysis, death	5-7	
mice (nb)		ip 0.03	death		
mice (nb)		sc			
mice (wn)		ic 0.03	death	4-7	
mice (wn)		ip			
calf (9-10 mo)	SMB 3 IbAn 7620	sc 3-4 ml	viremia, days 1-5	varied from 1.0-7.0 dex	

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
Hyalomma rufipes (ad) IbAn 7620, SM 3	Fed on viremic calf; virus recovered from tick after 12 days of attachment and 18 days after dropping. (Experiments carried out by Virus Lab., Univ. of Ibadan.)								

Section X - Histopathology

Character of lesions (specify host)
mice: severe cellular damage in the hippocampus

Inclusion Bodies — Intranuclear

Organs/Tissues Affected
brain (LV)

Category of tropism
Neurotropic

Section XI - Human Disease

In Nature	Residual	Death
Significant		**Significant**

Subclinical

Overt Disease
Significant

Clinical Manifestations
fever, headache, prostration, stiff neck, CNS signs (including encephalitis), hemorrhagic signs, and vomiting

Number of Cases
12 in Africa (1); hundreds in USSR (9)

Category (i.e. febrile illness, etc.)
Hemorrhagic fever; febrile illness

Section XII - Geographic Distribution

Known (Virus detected)

Suspected (Antibody only detected)

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Remarks