Virus Name: Ananindeua	Abbreviation: ANUV

Status
Probable Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Placed at this biosafety level based on close antigenic or genetic relationship to other viruses in a group of 3 or more viruses, all of which are classified at this level.

Other Information

Antigenic Group
Guama

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
BeAn 109303

Accession Number

Original Date Submitted
5/7/1984

Family
Bunyaviridae

Genus
Bunyavirus

Information From
F. Pinheiro and Amelia P.A.T. Rosa

Address
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Information Footnote
Revised

Section II - Original Source

Isolated By (name)
Belem Virus Laboratory

Isolated at Institute
Instituto Evandro Chagas, Belem

Host Genus
Caluromys p. philander

Species

Host Age/Stage
Adult

Sex
Male

Isolated From	Isolation Details
Whole Blood	

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method

Collection Date
9/22/1966

Place Collected (Minimum of City, State, Country)
Utinga Forest, Belem, Para, Brazil

Latitude
1° 28' S

Longitude
48° 27' W

Macrohabitat
Watershed forest

Microhabitat
Forest canopy

Method of Storage until Inoculated
At -60dC

Footnotes

Section III - Method of Isolation

Inoculation Date
9/23/1966

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons
Many other strains of the virus isolated in the same and nearby areas.

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)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:1000**	After Treatment Titer **3.8 dex**	Control Titer **8.0 dex**

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

Hemaggiutination	Antigen Source	Erythrocytes (species used)
Yes	**SM serum ext. by acetone**	**Goose**
pH Range	pH Optimum	
5.8-6.0	**6.0**	
Temperature Range	Temperature Optimum	
RT and 37dC	**Room temperature**	

Remarks

Serologic Methods Recommended
CF, HI, NT

Footnotes

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

Ananindeua virus is a member of group Guama, as shown by CF, HI, and NT.

CF TESTING

Ascitic Fluid or Hyperimmune Mouse Sera	ANTIGENS					
	Catu	Guama	Moju	Ananindeua	Bimiti	Timboteua
Catu	64/64[a]	32/64	16/64	8/64	32/256	0
Guama	64/64	64/256	64/256	32/64	64/256	4/64
Moju	64/16	64/64	64/256	32/64	64/256	0
Ananindeua	64/16	64/64	64/64	128/64	64/256	8/64
Bimiti	128/64	128/64	64/256	32/64	128/256	16/64
Timboteua	8/16	8/64	0	0	16/64	256/256
Guama Gr.	128/64	128/64	128/64	32/64	256/256	32/256

[a] Antibody titer/antigen titer; 0 = <4/<4

HI TESTING

HI TESTING

Ascitic Fluid or Hyperimmune Mouse Sera	ANTIGENS (4 units)					
	Catu	Guama	Moju	Ananindeua	Bimiti	Timboteua
Catu	160	0	0	0	0	0
Guama	0	80	20	40	0	0
Moju	0	20	160	0	0	0
Ananindeua	0	20	0	160	0	0
Bimiti	0	0	0	0	160	0
Timboteua	0	0	0	0	0	160
Gr. Guama	160	80	40	40	160	80

NT TESTING (INFANT MICE , ic ROUTE)

Ascitic Fluid or Hyperimmune Mouse Sera	VIRUS					
	Catu	Guama	Moju	Ananindeua	Bimiti	Timboteua
Catu	>5.0[b]	<1.2	<0.9	<0.5	<1.1	<1.3
Guama	<1.1	4.4	2.1	2.5	<1.1	<1.3
Moju	<1.1	<1.2	> 3.9	1.5	<1.1	<1.3
Ananindeua	<1.1	3.4	1.9	5.5	<1.1	<1.3
Bimiti	<1.1	<1.2	<0.9	<0.5	5.6	2.8
Timboteua	<1.1	<1.2	<0.9	<0.5	<1.1	> 6.3

[b] LNI in dex

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (LV), brain and viscera (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)
Vero (CL)	SMB 38	3	4+	6.0 [c]				
BHK-21 (CL)	SMB 20				4	2-3mm	5.7 [c]	

[c] 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. tsted Test used	Country and region
Caluromys p. philander (blood)	7		Utinga and IPEAN,Para, Brazil
Didelphis m. marsupialis (blood)	1		IPEAN, Para, Brazil
Sentinel mice (brain and liver)	109		
Sentinel monkey (blood)	1		
Sentinel chicken	1		
Wild bird (blood)	1		Humaita, Amazonas, Brazil
Marsupials		2/15 HI	APEG, IPEAN, Belem,Para, Brazil
Rodents		0/141 HI	
Marsupials		1/172 HI	Various areas of Amazon region, Brazil
Rodents		2/470 HI	

Primates		0/121 HI	
Carnivores		0/124 HI	
Edentates		0/65 HI	
Ungulates		0/24 HI	
Reptilies		0/38 HI	
Wild birds		79/6,576 HI	
Bats		0/188 HI	
Domestic birds		3/206 HI	Mojui dos Campos, Santarem, Para
Domestic pigs		2/49 HI	

Mosquitoes (Belem): 14 from Culex 284846 B-19 complex, 5 from Culex spp. 284846 284846 B-27, 3 from Culex (Mel) portesi 284846 , 2 from Culex taeniopus 284846 , 2 from Culex (Mel) sp. 284846 , 1 each from Culex vomerifer 284846 , Culex spp. and Coquillettidia venezuelensis.

Mojui dos Campos, Santarem, Para: 5 from Culicoides paraensis 267026 .

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 4	ic 0.02	Death	3.8	
Mice (nb)		ip 0.02	Death	6.0	
Mice (nb)		sc			
Mice (wn)		ic 0.03	Antibodies		
Mice (wn)		ip 0.03	Antibodies		
chickens (70 day)	SMB 4, BeAn 157441	im 0.5	No viremia, no antibodies (1)		

Section IX - Experimental Arthropod Infection and Transmission

Section X - Histopathology

Character of lesions (specify host)
Newborn mice: focal hepatic lesions of low intensity consisting of hyaline necrosis of isolated hepatocytes or small groups (1).

Inclusion Bodies — Intranuclear

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)
Brazil

Suspected (Antibody only detected)

Section XIII - References

1. Belem Virus Laboratory, Belem, Brazil. 1969. Unpublished data.
2. Calisher, C.H., et al. 1983. Am. J. Trop. Med. Hyg. 32:424-431.

Remarks