Virus Name: Caraparu	Abbreviation: CARV

Status
Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
C

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
BeAn 3994

Accession Number

Original Date Submitted
1/27/1985

Family
Bunyaviridae

Genus
Bunyavirus

Information From
Robert E. Shope

Address
Yale Arbovirus Research Unit, New Haven, Connectitcut

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Belem Virus Lab. (1)

Isolated at Institute
Belem, Para, Brazil

Host Genus
Cebus apella Sentinel

Species

Host Age/Stage
Adult

Sex
Female

Isolated From	Isolation Details
Serum/Plasma	

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
Femoral venipuncture

Collection Date
2/15/1956

Place Collected (Minimum of City, State, Country)
Instituto Agronomico do Norte Forest, Brazil

Latitude
2° S

Longitude
48° W

Macrohabitat
Old secondary growth forest

Microhabitat
Wire cage 5 meters above ground

Method of Storage until Inoculated

Footnotes

Section III - Method of Isolation

Inoculation Date
2/16/1956

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used
NT

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 **<2.5 dex**	Control Titer **5.4 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; hamster serum (8);SMB, liver ext. by acetone;sucrose-acetone + sonication (9)**	**Goose**
pH Range **5.7-6.4**	pH Optimum **6.0**	
Temperature Range	Temperature Optimum **27dC**	

Remarks

Serologic Methods Recommended
CF, HI, NT

Footnotes

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

Related by HI and NT to Apeu, by CF to Itaqui [2] , [3] .

Type strain H 5546 differs in CF reactivity [2] , [3] being related to Oriboca and Murutucu.

Strain TRVL 34053-1 is closely related to Caraparu, and isolates reported on the opposite page from Trinida belong to this strain.
SIRACA has antigenically classified Caraparu virus as a distinct virus type, and placed it in the Caraparu complex, one of four complexes comprising group C. SIRACA considers Ossa virus to be a subtype of Caraparu virus [22] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (M)(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)	
HeLa (CL),			CPE (5)						
HeLa S3 (CL)			CPE (5)						
HEp-1 (CL),			CPE (5)						
HEp-2 (CL)			CPE (5)						
Human embryo intestine (CL)			CPE (5)						
Rhesus monkey kidney (PC)						Plaques (6)			
BHK-21 (CL)					7	0.5-2.0mm	2.8-3.5* (17)		
Vero (CL)					10	2.0-2.5mm	1.7-3.6 (17)		

* 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	9	152/1,362 HI	Para and Amazonas, Brazil
Man	1		Surinam (11)
Man		4/63 NT	Colombia (19)
Man		64/100 NT	Peru (20)
Sentinel Cebus	31		Para, Brazil
Sentinel mouse	670/16,315		
Sentinel mouse	4		Almirante, Panama(7)
Sentinel mouse	29		Bush Bush, Trinidad (12)
Sentinel Oryzomys	1		
Oryzomys capito	7 **		Para, Brazil
Oryzomys laticeps	6		Bush Bush, Trinidad
Proechimys guyannensis	16		Para, Brazil
Nectomys squamipes	1		
Nectomys squamipes	1		Bush Bush, Trinidad
Zygodontomys brevicauda	4		
Heteromys anomalus	1		
Artibeus spp. (bats)		4 NT	Para, Brazil

(Isolations were from the blood in most cases.)

Mosquitoes: Culex vomerifer 13, Cx portesi 3, all other Culex 11, Belem; Cx portesi 19, all other Culex 9, Wyeomyia 1, Trinidad (13); Cx portesi 2, Limatus durhami 1, French Guiana (14).

Rodent HI 20-40%; marsupials much less.

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)		ic 0.02	Death	2.0	7.4
Mice (nb)		ip 0.02	Death, viremia	2.0	7.5
Mice (nb)		sc			
Mice (wn)		ic 0.03	Death, viremia	2.7	7.3
Mice (wn)		ip 0.03	Death	2.5	8.1
hamster (ad)		ic,sc	Death (8)	1.0-3.0	
rhesus monkey (ad)		sc	Irregular viremia (10)		
Oryzomys laticeps (ad)	P-9	sc 0.2	Viremia, antibody (15)		
Zygodontomys brevicauda (ad)		sc 0.2	Antibody (15)		

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
Aedes aegypti, Cx quinquefasciatus		Following parenteral inoculation, high virus titer detected in salivary glands after several passages (+ 4.0 dex/ml)(16).							
An quadrimaculatus		Following parenteral inoculation, propagation failed after 2 passages.							
Ae aegypti		Transmitted to mice in lab (11).							
Culex spp.		Naturally infected, transmitted to mice (21).							

Section X - Histopathology

Character of lesions (specify host)
ad, nb mice, ic and ip: brain - hydropic tumefaction, chromatolysis, neuronal retraction, necrosis. Liver hepatocytic vacuolization, hyalinization, Councilman bodies, preservation of central area with mononuclear proliferation of hepatic sinusoids (18). Monkey: no lesions in liver (4).

Inclusion Bodies
Lower Vertabrates

Intranuclear

Organs/Tissues Affected
Brain (LV), liver (LV),

Category of tropism
Neurotropic and viscerotropic in mice

Section XI - Human Disease

In Nature
Significant

Residual

Death

Subclinical
Reported

Overt Disease
Reported

Clinical Manifestations
Fever(S), headache (S), conjunctival inflammation (R), myalgia(S), arthralgia (S), leukopenia (S)

Number of Cases
10

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

Section XII - Geographic Distribution

Known (Virus detected)
Brazil; Panama; French Guiana; Surinam. (Caraparu-like agents have been isolated in Trinidad and in Panama)

Suspected (Antibody only detected)
Colombia, Peru, Venezuela (23)

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Remarks