Virus Name: Guaroa	Abbreviation: GROV

Status
Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
California

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
352111

Accession Number

Original Date Submitted
2/3/1985

Family
Bunyaviridae

Genus
Bunyavirus

Information From
H. Groot

Address
University of the Andes, Bogota, Colombia

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Groot, et al. (1)

Isolated at Institute
Bogota

Host Genus
Man

Species

Host Age/Stage
75 years

Sex
Female

Isolated From	Isolation Details
Serum/Plasma	

Signs and Symptoms of Illness
Apparently none

Arthropod

Time Held Alive before Inoculation

Collection Method
Vacuum-syringe

Collection Date
5/11/1956

Place Collected (Minimum of City, State, Country)
Guaroa (50 miles SW of Villavicencio), Colombia

Latitude
3° 51' N

Longitude
73° 29' W

Macrohabitat
Natural savannah at the edge of a gallery forest; altitude

Microhabitat
400 meters above sea level; rainfall 4000 mm per year; mean temp 25dC

Method of Storage until Inoculated
Refrigeration at 1dC

Footnotes

Section III - Method of Isolation

Inoculation Date
5/13/1956

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

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)
Labile at pH 5.0 to pH 2.0 (14)

Lipid Solvent (ether - % used to test)	After Treatment Titer **Sensitive (14)**	Control Titer
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate)	After Treatment Titer **Sensitive (14)**	Control Titer

Other (formalin, radiation)
Not inhibited in cell culture by 5-iodo-2-deoxyuridine (14)

Virion Morphology

Shape	Dimensions **70 - 90 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (17)**	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 **Yes**	Antigen Source **SMB ext. by sucrose-acetone**	Erythrocytes (species used) **Goose**
pH Range **5.7-6.2**	pH Optimum **6.0**	
Temperature Range	Temperature Optimum **22dC**	

Remarks

Serologic Methods Recommended
HI, CF, NT

Footnotes

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

Guaroa virus is related to members of the Bunyamwera group by complement- fixation tests. However, by NT and HI studies, Guaroa virus is related to members of the California group. Since the neutralization test is considered to provide the bases for serological classification of bunyaviruses [21] ,SIRACA has placed Guaroa virus in the California serogroup [22] . For relationship with other viruses, see References [3] and [22] .
Results of tests:

Immune Sera	HI Ht/Ho	CF Ht/Ho	NT Ht/Ho	Antigens/Viruses	HI Ht/Ho	CF Ht/Ho	NT Ht/Ho	Ref.
	Antigen/Virus of Guaroa				Immune Sera of Guaroa			
Batai	0/320			Batai	0/640			[2]
Bunyamwera	0/640	8/120	0.3/3.5	Bunyamwera	0/640	8/128		[2]
Cache Valley	0/160	32/512	0.3/3.5	Cache Valley	0/640	8/128	1.1/3.5	[2]
Ilesha	0/640			Ilesha	0/640			[2]
Germiston	0/1280			Germiston	0/640			[2]
Kairi		8/256		Kairi		0/128		[2]
Wyeomyia		8/256		Wyeomyia		0/128		[2]
Calovo	10/5120+	0/512+		Calovo	40/2560+	32/512+		[3]
California	10/320	0/64	1.6/5.3	California	0/320+	0/128	1.6/>4.3	[2]
Trivittatus	20/	0/128	2.0/5.5	Trivittatus		0/128	1.9/>4.3	[2]
Melao	0/	0/64	0.7/>4.0	Melao		0/128	1.0/>4.3	[2]
Tahyna	0/5120+	0/128		Tahyna	80/2560+	0/512+		[3]
Sathuperi		0/256		Sathuperi	40/2560+	0/512+		[3]
Manzanilla				Manzanilla	20/2560+			[3]
Bwamba	10/2560+	0/512+		Bwamba	10/2560+	0/512+		[3]
Koongol				Koongol	10/2560+			[3]

NT: LNI given in dex.

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (M)

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)	
HEp-2 (CL)			CPE (17)						
Chick embryo (PC)						Plaques (18)			
BHK-21 (CL)		2-3	4+	7.5* (23)		Plaques (19)			
Vero (CL)						Plaques (19)			

* 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	6/119		Guaroa, Colombia;1956(5)
Man		74/110	Colombia
Man	1/76		Guaroa and area, Colombia 1958
Man		27/69	Colombia
Man	0/18		Guaroa, Colombia;1959
Man		16/18	Colombia
Man	0/37		Orinoco forest, Colombia; 1958
Man		2/6	Colombia
Man		1/210	Upper Magdalena Valley, Colombia; 1958-59
Man		6/60	Mid Magdalena Valley, Colombia; 1956-57
Man		95/190	Mid Magdalena Valley, Colombia; 1957-60
Man		13/27	Gulf of Uraba, Colombia; 1960
Man		18% of 1300(HI)	Brazil (16)

Man The virus has been isolated five times from man near Belem, Brazil. The first isolation in Brazil was made by liver biopsy (6,7); the others were made from the blood of febrile laborers. HI antibodies are prevalent in human residents in the Amazon Region (6,7).

Mosquitoes Isolation from a pool of Anopheline mosquitoes collected in Bocas del Toro, Panama (8,9) and from two pools of Anopheles (Ker) neivai captured in Pacific Coast rain forest of Colombia (12), and from six pools of An neivai taken in 1962 and 1964 from Pacific lowlands of Colombia (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)	MB 1	ic+0.015	Death	3-5	
Mice (nb)		ip			
Mice (nb)		sc 0.015	Death	5-7	
Mice (wn)		ic 0.03	Death	5-8	
Mice (wn)		sc 0.03	Devel. of immunity		
Mice (wn)		in 0.1	Survival		
Mice (2 wk)	Human serum; natural infection	ic 0.015	Death	6-9	6.0*
Burros			Antibody response only (15)		
Macaca	Human serum;				
mulatta (ad)	natural infection	sc 0.2	Viremia from 2nd to 8th day		2.1**
mulatta (ad)	MB suspension	ic 0.2	Development of immunity and occasionally transient paralysis.		

* in brain tissue; ** in serum, day of maximum viremia

Remarks: Guaroa virus has been isolated from febrile individuals and from apparently healthy individuals.

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
Guaroa virus multiplies in experimentally infected Aedes aegypti, Culex pipiens and Anopheles quadrimaculatus (10).									
Multiplies in Ae aegypti, Ae triseriatus, and Psorophora ferox afterintrathoracic inoculation (20).									

Section X - Histopathology

Character of lesions (specify host)

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature — Residual — Death

Reported

Subclinical — Overt Disease

Clinical Manifestations

Fever (R), headache (S), prostration (R), myalgia (R), arthralgia (R), leukopenia (R). One patient with alopecia and paresis but cause and effect in relation to Guaroa infection not proven

Number of Cases — Category (i.e. febrile illness, etc.)

Five

Section XII - Geographic Distribution

Known (Virus detected)

Colombia, Brazil, Panama

Suspected (Antibody only detected)

Argentina (10), Peru (4)

Section XIII - References

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Remarks