Virus Name: Itaporanga	Abbreviation: ITPV

Status
Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Phlebotomus Fever

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
prototype

Accession Number

Original Date Submitted
12/27/1984

Family
Bunyaviridae

Genus
Phlebovirus

Information From
E. Trapp and R. Shope

Address
Instituto Biologico, Sao Paulo and Instituto Evandro Chagas, Belem, Brazil

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Dr. Ewald Trapp (1)

Isolated at Institute
Itaporanga, Sao Paulo, Brazil

Host Genus
Swiss mouse, sentinel

Species

Host Age/Stage
Baby

Sex
Not Answered

Isolated From	Isolation Details
Organs/Tissues	**Brain**

Signs and Symptoms of Illness
Death

Arthropod

Time Held Alive before Inoculation

Collection Method

Collection Date
4/4/1962

Place Collected (Minimum of City, State, Country)
16 km from city of Itaporanga, Brazil

Latitude
23° S

Longitude
48° W

Macrohabitat
Forest border at edge of lake formed by Rio Itarare

Microhabitat
Ground level

Method of Storage until Inoculated

Footnotes

Section III - Method of Isolation

Inoculation Date

Animal (Details will be in Section 6)
nb mice

Route Inoculated

Reisolation

Other Reasons
Virus newly recognized in this region.

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)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:1000**	After Treatment Titer **<3.8 dex**	Control Titer **4.5 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	**SMB ext. by sucrose-acetone; sm serum ext. twice by acetone**	**Goose**
pH Range **6.0-6.5**	pH Optimum **6.4**	
Temperature Range	Temperature Optimum **27dC**	

Remarks
CF antigen from liver is often higher titered than from brain

Serologic Methods Recommended
HI, CF, NT

Footnotes
CF antigen from liver is often higher titered than from brain

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

Related to Icoaraci (Phlebotomus fever group) by HI:

Mouse hyperimmune Serum	Antigen (8 units)	
	Itaporanga	Icoaraci
Itaporanga	320	<20
Icoaraci	160	320

Whitman (personal communication) reports Itaporanga related by HI to Naples sandfly fever virus.

Itaporanga hemagglutinin was not inhibited by hyperimmune sera for arboviruses of groups A, B, C, Bunyamwera and Guama plus 46 other arboviruses either ungrouped or in groups not yet recognized in formal publications; Sicilian sandfly fever virus serum is included in this list. Itaporanga serum (homologous titer = 320) did not inhibit hemagglutination of antigens for arbovirus groups A, B, C, and Guama.
A CF antigen for Itaporanga virus did not react with hyperimmune sera for arboviruses of groups A, B, C, Bunyamwera or Guama or for nine other arboviruses, including Icoaraci. Itaporanga serum (homologous titer = 64) did not fix complement with antigens for Bunyamwera group virus, seven other arboviruses including Icoaraci, or mouse encephalomyelitis virus.
In neutralization testing, the homologous hyperimmune mouse serum neutralized 2.4 dex LD50 of Itaporanga virus, but no significant neutralization by Icoaraci serum (homologous neutralizing index 2.8 dex LD50) was demonstrated. Conversely, Itaporanga serum failed to neutralize Icoaraci virus.
More recent serological studies indicate that Itaporanga virus is distinct by NT from other members of the PHL serogroup [9] , [10] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (LV), CNS (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)	
Chick embryo (PC)	MB 11				2-4	2 sizes	6.9* (7)		
BHK-21 (CL)					4	Plaques	5.45 (7)		
Vero (CL)	SM 3				4	1 mm	5.7 (5)		
LLC-MK2 (CL)					3	6 mm	4.9 (5)		

* 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		27/82 NT	Xingu, Brazil
Sentinel mice	1/5		Itaporanga, SP, Brazil
Sentinel mice	5/16,315		Belem, Brazil (6)
Caluromys	1	11/23 HI	Belem, Brazil
Marmosa sp.		2/11 HI	
Didelphis marsupialis		1/12 HI	
Marmosa murina		0/8 HI	
Philander opossum		0/3 HI	
Forest floor rodents		0/193 HI	
Forest birds		13/533 HI	Belem, Brazil (4)
Open field birds		0/180 HI	
Thamnophilus aethiops (bird)	1		Belem, Brazil
Forest bats		8/538 NT	
Culex eastor	2		Trinidad (2)
Culex "caudelli"	1		Belem, Brazil
Culex spp.	2		Belem and Amapa, Brazil
Culex spp.	1		Fr. Guiana (3)
Coquillettidia venezuelensis	1		Belem, Brazil

NOTE: Virus isolation and HI antibody studies are interpreted as indicating that natural transmission in Utinga forest, Belem in 1964 is limited to vertebrates inhabiting the forest canopy such as bats, forest birds, Caluromys, and Marmosa sp. Forest floor animals are uniformly negative.

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 7	ic 0.015	Death	1.0 *	6.9
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)		ic 0.03	Antibody		
Mice (wn)		ip			
hamsters (25 day)	BeAn 64582	ip,sc	Viremia, HI and CF antibody		

* AST of 1.0 days in baby mice using 10% mouse brain; AST varies up to 7 days with more dilute inoculum and in earlier passage levels.

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
Virus multiplication in Aedes albopictus and Culex quinquefasciatus tested by plaque assay in Vero cells after 10 days at 32/C following intrathoracic inoculation (8).									

Section X - Histopathology

Character of lesions (specify host)
sm: In skeletal and cardiac muscle - isolated fibers or bundles swollen, hyalinized, and sometimes dissociated by interstitial oedema; in young connective tissue, periosteum, perichondrium, dura mater and nerve fibers, some necrosis (L.B. Dias).

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; Trinidad; French Guiana

Suspected (Antibody only detected)

Section XIII - References

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Remarks