Virus Name: Arbia	Abbreviation: ARBV

Status
Probable Arbovirus

Select Agent
No

SALS Level
3

SALS Basis
Isufficient experience with virus; i.e., experience factor from SALS surveys was less than 500 in laboratory facilities with low biocontainment.

Other Information

Antigenic Group
Phlebotomus Fever

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
ISS.Phl.18

Accession Number

Original Date Submitted
5/1/1985

Family
Bunyaviridae

Genus
Phlebovirus

Information From
P. Verani, et. al.

Address
Instituto Superiore di Sanita, Viale Regina Elena 299, I-00161 Rome, Italy

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
P. Verani, et. al. (1,6)

Isolated at Institute
Instituto Superiore di Sanita

Host Genus
Phlebotomus perniciosus

Species

Host Age/Stage

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod
Engorged

Time Held Alive before Inoculation
A few hours

Collection Method
Caught by hand

Collection Date
7/25/1980

Place Collected (Minimum of City, State, Country)
Sesto Fiorentino, Toscana, Italy

Latitude
43° 50' N

Longitude
11° 10' E

Macrohabitat
Hills covered by deciduous woods (250 meters alt.)

Microhabitat
Poultry yard

Method of Storage until Inoculated
-70dC

Footnotes

Section III - Method of Isolation

Inoculation Date
10/3/1980

Animal (Details will be in Section 6)
nb mice (Tissue Culture)

Route Inoculated
Intracerebral

Reisolation

Other Reasons

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)	After Treatment Titer	Control Titer

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 **Yes**	Antigen Source **SMB ext. by sucrose-acetone**	Erythrocytes (species used) **Goose**
pH Range **5.75-6.2**	pH Optimum **6.0**	
Temperature Range **22dC-37dC**	Temperature Optimum **37dC**	

Remarks
HA production is difficult, usually of poor titre

Serologic Methods Recommended
CF, NT, IFA

Footnotes
HA production is difficult, usually of poor titre

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

ISS.Phl.18 antigen and MIAF did not react in CF test with antigens and MIAF prepared against Toscana , SFN, and SFS viruses.

At YARU [2] ; ISS.Phl.18 was screened by indirect fluorescent antibody test against the following MIAF: Phlebotomus fever group, Toscana , SFN, Arumowot, Gordil, Saint Floris, SFS, Rift Valley Fever , Karimabad, Salehabad, Gabek Forest, VSV group, Isfahan , Chandipura , and Jug Bogdanovac. Positive reactions were obtained with Toscana , SFN, Gordil, Saint Floris, Salehabad, Gabek Forest, and the Phlebotomus fever group MIAF. ISS.Phl.18 antigen and MIAF were then tested by CF against Salehabad, Gabek Forest, Gordil, Toscana , SFN, Saint Floris antigens, and MIAF. Positive reactions were obtained between ISS.Phl.18, Salehabad, and Gabek Forest.

ANTIGEN	MIAF		
	ISS.Phl.18	Salehabad	Gabek Forest
ISS.Phl.18	256/> 256 [a]	128/>64	<4/<4
Salehabad	64/>128	256/> 128	<4/<4
Gabek Forest	16/4	<4/<4	>256/> 128

[a] Serum titer/antigen titer.

Cross NT tests (plaque reduction method) between ISS.Phl.18 and Salehabad viruses and MIAF gave the following results:

VIRUS	MIAF	
	ISS.Phl.18	Salehabad
ISS.Phl.18	160 [b]	<10
Salehabad	<10	320

[b] Dilution producing >90% plaque reduction.

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Newborn mice and Vero cell cultures

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 4	3	4+	6.4 [c]	5	pinpoint	7.6[c]	
Vero (CL)	Vero 3	3	4+		5	pinpoint	5.9	

[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
Man		0/105 HI	Toscana, Italy
Chicken		0/65 HI	
Rabbit		0/2 HI	
Phlebotomus perniciosus	3/609		Florence province, Toscana,Italy(1,6)
Phlebotomus perniciosus(males)	1		
Phlebotomus perfiliewi	23/9,351		Siena province,Toscana, Italy (3)
Phlebotomus perfiliewi (males)	3		
Phlebotomus perfiliewi	2/882		Teramo province, Abruzzo, Italy

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)	SMB5	ic 0.01	Death	4	8.24
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	SMB 6	ic 0.03	Death	6	
Mice (wn)	SMB 4	ip 0.05	Antibodies		
rabbit		ic 0.20	Antibodies		
rabbit		ip 1.00	Antibodies		

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
Phlebotomus perniciosus , artificial "blood" meal	8.8		8-10	26 °			3.5 *		Vero Cells (TCID50)
Arbia virus replicated in intrathoracically inoculated female Phlebotomus perniciousus . Sandflies were refractory or resistant to oral infection (4,5). Experimental transovarialtransmission of Arbia virus demonstrated (5).									

* Mean virus titer per insect for 10 positive female insects.

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
Subclinical	Overt Disease	
Clinical Manifestations		
Number of Cases	Category (i.e. febrile illness, etc.)	

Section XII - Geographic Distribution

Known (Virus detected)
Central Italy

Suspected (Antibody only detected)

Section XIII - References

1. Verani, P. et al. 1982. Unpublished data.
2. Tesh, R.B. Personal communication. 1983.
3. Verani, P. et al. 1983. Unpublished data.
4. Ciufolini, M.G., et al. 1985. Am. J. Trop. Med. Hyg. 34:174-179.
5. Tesh, R.B. and Modi, G.B. 1984. Am. J. Trop. Med. Hyg. 33:1007-1016.
6. Verani, P., et al. 1988. Am. J. Trop. Med. Hyg. 38:433-439.

Remarks