Virus Name: Buenaventura		Abbreviation: BUEV
Status **Possible 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	Accession Number	Original Date Submitted
CoAr 3319		7/6/1984

Family	Genus
Bunyaviridae	**Phlebovirus**

Information From	Address
Robert B. Tesh	**Pacific Research Section P.O. Box 1680, Honolulu, Hawaii 96806**

Information Footnote
Revised

Section II - Original Source

Isolated By (name)	Isolated at Institute	
Carlos Sanmartin	**Universidad Del Valle, Cali, Colombia**	
Host Genus	Species	Host Age/Stage
Lutzomyia (mixed species; pool of 337)		**Adults**

Sex
Female

Isolated From	Isolation Details
Signs and Symptoms of Illness	Arthropod

Time Held Alive before Inoculation
12-24 hours

Collection Method	Collection Date
Human bait (2)	**9/1/1964**

Place Collected (Minimum of City, State, Country)
Rio Raposo, near Buenaventura, Colombia

Latitude	Longitude
3° 54' N	**77° 2' W**

Macrohabitat	Microhabitat	Method of Storage until Inoculated
Tropical rain forest covering low hills (<50 meters elevation)	**Ground level at early evening (2)**	**Transported on dry ice; then mechanical freezer at -70dC**

Footnotes

Section III - Method of Isolation

Inoculation Date
10/15/1964

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons
No other Phlebotomus fever group viruses in laboratory (2)

Homologous Antibody Formation by Source Animal

Test(s) Used

Footnotes

Section IV - Virus Properties

Physicochemical
RNA, Single Strand

Pieces (number of genome segments) **3**	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	Antigen Source	Erythrocytes (species used)
pH Range	pH Optimum	
Temperature Range	Temperature Optimum	
Remarks		

Serologic Methods Recommended
CF, NT

Footnotes

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

Buenaventura antigen and hyperimmune serum (homologous titer = 64/512) did not react in cross-CF tests with the following antigens and immune sera: Frijoles, Caimito, Nique, Aguacate, Cacao, Chagres, Candiru, Itaporanga, Urucuri, Pacui, Anhanga, Bujaru, Arumowot, Sicilian, Naples, Gabek Forest, Karimabad, Salehabad, Alenquer, Itaituba, and Charleville [1] .
Cross-neutralization tests (plaque method) using Buenaventura virus and hyperimmune serum (homologous titer = 128) were done against each of the following viruses and specific antisera with negative results: Frijoles, Caimito, Nique, Aguacate, Chilibre, Cacao, Chagres, Candiru, Itaporanga, Urucuri, Pacui, Anhanga, Bujaru, Arumowot, Sicilian, Naples, Gabek Forest, Karimabad, Salehabad, Gordil, Saint Floris, Rio Grande, Alenquer, Itaituba and Charleville [1] .
Antigenic relationships between Buenaventura, Punta Toro and Icoaraci by both CF and NT were noted as follows [1] :

	Antigen/Virus					
	Buenaventura		Punta Toro		Icoaraci	
Antiserum	CF	NT	CF	NT	CF	NT
Buenaventura	64/512	128	<4/<4	32	<4/<4	<16
Punta Toro	8/32	256	64/256	8192	<4/<4	64
Icoaraci	8/16	32	<4/<4	1024	>2048/256	32000

CF: Antibody titer/antigen titer

NT: Reciprocal of highest serum dilution producing >90% plaque reduction

Buenaventura hyperimmune serum (homologous titer not determined) was tested by HI against 9 other PHL group antigens with the following results: Frijoles (<10), Aguacate (20), Chagres (<10), Icoaraci (80), Itaporanga (10), Anhanga (<10), Arumowot (10), Sicilian (<10) and Karimabad (<10) [1] .

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)	SM 8, Vero 3	5	3-4+		6	pinpoint	5.6*		

* 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
Lutzomyia (mixed species and sexes)	5/about 34,000 *		Raposo River, Buenaventura, Colombia (2)
Lutzomyia (mixed species and sexes)	1/about 150,000 *		Palmares del Pacifico Buenaventura, Colombia (2)

* See XIV.(1) Remarks

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)	Prototype; SM 4	ic 0.02	Death (2)	6.6	
Mice (nb)		ip 0.02	None (2)		
Mice (nb)		sc			
Mice (wn)		ic 0.02	None (2)		
Mice (wn)		ip 0.02	None (2)		
Mice (nb)	Prototype; SM 8 Vero 4	ic 0.02	Death (no viremia)	5.8	7.2 (brain)

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 albopictus		5.0	10	32			X		No virus present after 10 days as assayed in Vero cells (4).
Culex quinquefasciatus		5.0	10	32			X		Same

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)
Colombia and Panama (2,3)

Suspected (Antibody only detected)

1. Tesh, R.B. et al. 1975. Am. J. Trop. Med. Hyg. 24:135-144.

2. Sanmartin, C. Personal communication. 1978.

3. Tesh, R.B. et al. 1974. Am. J. Trop. Med. Hyg. 23:258-269.

4. Tesh, R.B. 1975. J. Med. Ent. 12:1-4.

Section XIII - References

1. Tesh, R.B. et al. 1975. Am. J. Trop. Med. Hyg. 24:135-144.
2. Sanmartin, C. Personal communication. 1978.
3. Tesh, R.B. et al. 1974. Am. J. Trop. Med. Hyg. 23:258-269.
4. Tesh, R.B. 1975. J. Med. Ent. 12:1-4.

Remarks

Several closely related or identical viruses isolated from Lutzomyia (mixed species and sexes) in Panama (3).