Virus Name: Estero Real	Abbreviation: ERV

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
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
K 329

Accession Number

Original Date Submitted
4/30/1985

Family
Not listed

Genus
Not listed

Information From
D. Malkova

Address
Inst. Parasit., Czech. Acad. of Sciences, 166 32 Prague 6, Flemingovo NAM 2, Czechoslovakia

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
D. Malkova

Isolated at Institute
Prague, Czech.

Host Genus
Ornithodoros tadaridae (pool of 40 ticks)

Species

Host Age/Stage
Nymph

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod
Engorged

Time Held Alive before Inoculation
3 days

Collection Method
Manual collection off leaves

Collection Date
4/26/1980

Place Collected (Minimum of City, State, Country)
El Estero Real, Sancti Spiritus, Cuba

Latitude
22° 20' N

Longitude
79° 4' W

Macrohabitat
Palm forest

Microhabitat
Leaves of the head of a palm

Method of Storage until Inoculated
Held alive

Footnotes

Section III - Method of Isolation

Inoculation Date
4/29/1980

Animal (Details will be in Section 6)
nb mice

Route Inoculated
ic and sc

Reisolation

Other Reasons

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used

Footnotes

Section IV - Virus Properties

Physicochemical
RNA

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)
infectivity stable @ pH 6.0-9.0; opt.= pH7.0-8.0

Lipid Solvent (ether - % used to test)	After Treatment Titer	Control Titer
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **1:500, 1:1000**	After Treatment Titer **<1.0 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)
No	**SMB ext. with sucrose-acetone**	**Sheep**
pH Range **6.0-6.8**	pH Optimum	
Temperature Range **37dC**	Temperature Optimum	

Remarks
*** Virus multiplication not inhibited by BUDR, 50 mcg/ml or actinomycin D, 0.2 mcg/ml.**

Serologic Methods Recommended
NT, CF, IFA

Footnotes
*** Virus multiplication not inhibited by BUDR, 50 mcg/ml or actinomycin D, 0.2 mcg/ml.**

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

Using IFA, NT, and PRNT, a relationship to the following tick-borne viruses was excluded: Hughes, Soldado, Wad Medani, Sawgrass and African swine fever, all of which occur in the Carribean area. Other tick-borne viruses which were negative included Powassan, Eyach, TBE, and Tribec. In addition, Estero Real virus was not related to the following mosquito-borne viruses: Group A (WEE, VEE, EEE, chikungunya, Sindbis), Group B (WN, SLE, dengue 1 - 4, and YF), California group (Tahyna), mouse rabies and Tettnang (MHV related) viruses.
Using the CF method [1] no reaction was detected with MAF for the following: (Grouping) Bunyamwera, Kemerovo, Quaranfil, Polyvalent rabies, etc. (rabies, LCM, NDV, herpes, and vaccinia), and Tacaribe, Polyvalent 1 (Bahig, Tete, Matruh, Matariya, EgAn 1398-61, Burg el Arab), Polyvalent 2 (Jurona, Minatitlan, MARU 11079, Gamboa, BeAn 141106), Polyvalent 3 (Koongol, Wongal, Bakau, Ketapang, Mapputta, Trubanaman, Maprik), Polyvalent 4 (Nyamanini, Uukuniemi, Grand Arbaud, Thogoto), Polyvalent 5 (Hughes, Soldado, Sawgrass, Matucare, Lone Star), Polyvalent 6 (Marco, Chaco, Timbo, Pacui), Polyvalent 7 (Hart Park, Flanders, Kern Canyon, Klamath, Mt. Elgon bat), Polyvalent 8 (epizootic hemorrhagic disease of deer, Changuinola, Irituia, Colorado tick fever, bluetongue, IbAr 22619), Polyvalent 9 (Navarro, Triniti, Aruac, Pacora), Polyvalent 10 (Upolu, Dera Ghazi Khan, Wanowrie, Dhori), Polyvalent 12 (Okola, Olifantsvlei, Witwatersrand, Bobia, Tataguine). Estero Real virus also was unrelated by CF to the following individual viruses: Avalon, Aransas Bay, Colorado tick fever, Bauline, Great Island, Hughes, Huacho, Matucare, Mono Lake, Lone Star, New Minto, Powassan, Punta Salinas, Sakhalin, Sawgrass, Silverwater, Sixgun City, Soldado, Sunday Canyon, Tyuleniy, Uukuniemi, Wad Medani and Yaquina Head [1] .
Estero Real virus is realted by IFA and CF to Abras virus and by CF to Zegla virus, both of the Patois antigenic group [2] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

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)	
PS (CL)			No CPE			No plaques		+	
CV-1 (CL)		2	3+	5.3*		1-2 mm	6.4*		
Vero (CL)		2	2+	4.6		Minute	>5.0		
LLC-MK2 (CL)		3	1+	3.2		Barely visible plaques			
BHK-21 (CL)		3	No CPE			No plaques		+	
LB (CL)			No CPE			No plaques		-	
HeLa (CL)			No CPE			No plaques		-	
XTC-2 (CL)		3	2+	5.2		Minute	>5.0		
Chick embryo (PC)			No CPE			No plaques		-	

* 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
Ornithodoros tadaridae	8/12 pools		Sancti Spiritus, Cuba

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)	K 329	ic	Sickness, death		6.2-7.0
Mice (nb)		ip	Sickness, death		2.1-2.6
Mice (nb)		sc			
Mice (wn)		ic	Negative		
Mice (wn)		ip			
"" (ad)		ic	Negative		
"" (ad)		ip	Negative		
"" (ad)		sc	Negative		
hamsters (nb)		ic	Negative		
"" (nb)		ip	Negative		
"" (nb)		sc	Negative		
1-2 day chicks		ic	Negative		
"" "" ""		ip	Negative		
"" "" ""		sc	Negative		
embryonated chick eggs		CAC	Survival, but mult. in embryo		
		am.s.	Survival, but mult. in embryo		
		ys	Death following mult.in yolk sac and embryo		3-4

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

Section X - Histopathology

Character of lesions (specify host)
Mouse: encephalitis. No changes in lungs, liver, spleen, kidney, and myocardium.

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)
Cuba

Suspected (Antibody only detected)

Section XIII - References

1. Calisher, C.H., et al. 1983. Personal communication.
2. Zeller, H. et al. 1989. II. Arch. Virol. Submitted.

Remarks