Virus Name: Marco	Abbreviation: MCOV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Mossuril

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
BeAn 40290

Accession Number

Original Date Submitted
2/27/1985

Family
Rhabdoviridae

Genus
Not listed

Information From
Robert E. Shope

Address
Yale Arbovirus Research Unit, New Haven, Connecticut

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Belem Virus Laboratory (1)

Isolated at Institute
Belem, Para, Brazil

Host Genus
Ameiva ameiva ameiva (one female and one male)

Species

Host Age/Stage
Adult

Sex
Not Answered

Isolated From	Isolation Details
Organs/Tissues	**Heart and liver pool**

Signs and Symptoms of Illness
None observed

Arthropod

Time Held Alive before Inoculation

Collection Method
Captured with noose

Collection Date
3/2/1962

Place Collected (Minimum of City, State, Country)
Utinga forest, Brazil

Latitude
1° 28' S

Longitude
48° 27' W

Macrohabitat
Watershed forest

Microhabitat
Ground level

Method of Storage until Inoculated
Not stored

Footnotes

Section III - Method of Isolation

Inoculation Date
3/2/1962

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons

Homologous Antibody Formation by Source Animal
Not tested

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 **<1.6 dex**	Control Titer **4.6 dex**

Other (formalin, radiation)

Virion Morphology

Shape **Short conical rhabdovirus (3)**	Dimensions **154 x 95 nm**	
Mean nm	Range nm	
Measurement Method **By electron microscopy**	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 **No**	Antigen Source **SMB; serum ext. by sucrose-acetone; acetone**	Erythrocytes (species used) **Goose**
pH Range	pH Optimum	
Temperature Range	Temperature Optimum	

Remarks

Serologic Methods Recommended
HI, CF

Footnotes

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

Marco antigen did not react in CF testing with: Mucambo, EEE, Mayaro, Una, Aura, Pixuna, YF, Ilheus, Bussuquara, SLE, Oriboca, Murutucu, Apeu, Caraparu, Marituba, Itaqui, Nepuyo, Catu, Guama, Moju, Capim, Guajara, Bushbush, Mirim, Maguari, Kairi, Guaroa, Tucunduba, Taiassui, Sororoca, Melao, Oropouche, Icoaraci, Tacaiuma, Turlock, Cocal, Lukuni, Candiru, Piry, Pacui, Acara, Irituia, Jurona, Timbo, Chaco, Anhanga, Naples, Chagres, Germiston, Bunyamwera, Batai, Ilesha, California, trivittatus, Tahyna, Lumbo, Sathuperi, Akabane, Ingwavuma, Manzanilla, EHD-NJ, Triniti, Ieri, Aruac, Tacaribe, Navarro, Hart Park, Colorado tick fever, Anopheles A and B, Panama J55, B535, Cas Cas, Tete, TRVL42336, Nyamanini, Witwatersrand, Quaranfil, Sicilian, Wad Medani, Bwamba, Mossuril, Wongal, Mapputta, Bakau, Ketapang, Wanowrie, Ganjam, Nodamura, Tsuruse, K-622, Chenuda, Lebombo, Palyam VSNJ, Simbu, Junin.
Marco serum (hyperimmune; titer = 128) did not react in CF testing with: Jurona, Timbo, Chaco, Anhanga, Candiru.

Marco serum did not inhibit hemagglutination of: EEE, Mucambo, Aura, Una, Mayaro, Pixuna, YF, Ilheus, Bussuquara, SLE, Oriboca, Murutucu, Caraparu, Guama, Maguari, Guaroa, Icoaraci, Tacaiuma, Turlock, Candiru, Anhanga, Catu.
Marco virus was placed in the Mossuril serogroup on the basis of an antigenic relationship it shared with Charleville virus; the latter virus also was antigenically related to all other members of the serogroup [7] .
Marco virus was tested against 88 other rhabdoviruses and no antigenic relationship was detected [8] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (M), 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)						No plaques (4)			
HeLa (CL)			CPE (poor)	4.5* (2)					
BHK-21 (CL)		3	CPE	5.2 (5)					
PS (CL)		3	No CPE**	4.4				+ (5)	
E6 (CL)		6	CPE**	8.0 (5)					
C6/36 (CL)		5	No CPE**	5.7				+ (5)	
Vero (CL)					8-9	Plaques** (5)			

* Expressed in dex

** Infected cell cultures incubated at 25C

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
Ameiva ameiva ameiva	4/1526		Para, Brazil
Other reptiles	0/4,400	0/40 CF	
Birds	0/6,000		
Amphibians	0/42		
Man	0/2,095		
Rodents	0/11,043		
Marsupials	0/1,950		
Monkeys	0/87		
Bats	0/878		
Edentates	0/127		
Carnivores	0/32		
Horses and cattle	0/185		
Sentinel mice	0/16,315		Amazon region, Brazil
Arthropods	0/20,758 pools		

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)	P-10	ic 0.02	Death	2.0	6.2
Mice (nb)	P-3	ip 0.02	None		
Mice (nb)		sc			
Mice (wn)		ic 0.03	Antibody		
Mice (wn)		ip 0.03	Antibody		
hamsters (ad)		ip	Antibody		

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 aegypti	Carried through 5 mosquito passages by intrathoracic inoculation of salivary gland material before discontinuing (6).								
Anopheles quadrimaculatus	Failed after 2 passages.								

Section X - Histopathology

Character of lesions (specify host)
nb mice: Encephalitis only (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

Suspected (Antibody only detected)

Section XIII - References

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Remarks