Virus Name: Mono Lake	Abbreviation: MLV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Kemerovo

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
Ar 861

Accession Number

Original Date Submitted
11/27/1984

Family
Reoviridae

Genus
Orbivirus

Information From
Harald N. Johnson and Jordi Casals

Address
California Dept. of Health, Berkeley, CA and Yale Arbovirus Research Unit, New Haven, CT

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Harald N. Johnson (1)

Isolated at Institute
Berkeley, CA

Host Genus
Argas cooleyi, pool of 10 ticks

Species

Host Age/Stage
Adult

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
By hand

Collection Date
5/18/1966

Place Collected (Minimum of City, State, Country)
Mono Lake, Mono County, California, USA

Latitude
38° N

Longitude
119° W

Macrohabitat
Small rocky island near Negit Island in Mono Lake

Microhabitat
Rock clefts and rocky debris under nests of Larus californicus gulls

Method of Storage until Inoculated
Held alive in plastic bags with rock debris from nests

Footnotes

Section III - Method of Isolation

Inoculation Date
5/24/1966

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

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 **No**	Antigen Source **SMB ext. by sucrose-acetone**	Erythrocytes (species used) **Goose**
pH Range **6.0-7.0**	pH Optimum	
Temperature Range **37dC**	Temperature Optimum	

Remarks

Serologic Methods Recommended
CF, NT

Footnotes

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

Complement-fixation test:

Grouping immune sera or ascitic fluids (in dilutions beginning at 1:4) for the listed groups, reacted negatively against antigen Mono Lake at dilution 1:8: Groups A, B, C, Anopheles A, Bunyamwera, Bwamba, California, Capim, Guama, Nyando, Palyam, rhabdoviruses, Simbu, Tacaribe, Tete, and VSV.
The following type specific sera diluted as above, reacted negatively with Mono Lake antigen: Aruac, Changuinola, Cotia, Kern Canyon, LCM, Lukuni, Nariva, Pacui, rabies, and Tembe.
Immune serum for Mono Lake with a titer of 128, reacted negatively with the following antigens: Acara, Aruac, Hart Park, Jurona, Lebombo, Mapputta, Marco, Mirim, Mossuril, Navarro, Nyando, Pacui, Palyam, and Triniti.
In cross complement-fixation tests with about 40 non-group B tick-borne viruses, Mono Lake has only cross-reacted with members of the Kemerovo group. An example of the crossing is shown:

Complement-fixation Test

	Serum						
Antigen	**KEM**	**LIP**	**TRB**	**CNU**	**ML**	**HUA**	**WM**
Kemerovo	512/128	64/32	64/32	8/8	16/32	0	0
Lipovnik	64/64	256/64	128/64	8/8	8/8	0	Traces
Tribec	64/256	128/256	128/256	8/32	16/128	0	Traces
Chenuda	16/16	32/32	32/32	256/128	64/64	16/8	Traces
Mono Lake	16/16	8/16	32/16	32/16	256/64	64/32	
Huacho	8/8			16/16	128/32	256/32	
Wad Medani	0		8/16				128/64

Serum titer/antigen titer; first dilution = 1:4.

Neutralization Test

	Virus	
Serum	**Mono Lake**	**Huacho**
Mono Lake	<1.5	3.6
Huacho	2.5	<1.5
Normal mouse	5.1	5.2

Virus titer in dex, in the presence of the serum; ic test in mice.

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)	
Vero (CL)	P8					1-3 mm	5.3* (2)		
MA-111 (CL)						1-3 mm (2)			
DE (PC)						No plaques (2)			

* 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
Argas cooleyi	1/6		Mono Lake, CA, USA

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)	Original	ic 0.015	4/8 sick, 10-15 days		
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	P4	ic 0.015	4/4 sick, 6-15 days		
Mice (wn)		ip			
Mice (nb)	P6	ic 0.015	8/8 dead	9-17	3.0
Mice (nb)	P8	ic 0.015	8/8 dead	6-7	

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)

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)
California, USA.

Suspected (Antibody only detected)

Section XIII - References

1. Johnson, H.N. and Casals, J. 1972. In: Transcontinental Connections of Migratory Birds and their Role in the Distribution of Arboviruses; edited by Cherepanov, A.I., et al. Publishing House "NAUKA". Siberian Branch, Novosibirsk.
2. Calisher, C.H. Personal communication. 1977.

Remarks

Closely related virus isolated from Argas cooleyi from swallow nests in Texas by Rocky Mountain Laboratory, Hamilton, Montana (Sixgun City).