Virus Name: Lednice	Abbreviation: LEDV

Status
Probable Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Placed at this biosafety level based on close antigenic or genetic relationship to other viruses in a group of 3 or more viruses, all of which are classified at this level.

Other Information

Antigenic Group
Turlock Group

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
Strain 6118

Accession Number

Original Date Submitted
8/31/1984

Family
Bunyaviridae

Genus
Bunyavirus

Information From
Doubravka Malkova

Address
Institute of Parasitology, Czechoslovak Academy of Sciences, Flemingovo n.2,166 32 Prague 6, Czechoslovakia

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
Malkova et al (1)

Isolated at Institute
Inst. Parasitology, Prague

Host Genus
Culex modestus Fic., pool of 300 mosquitoes

Species

Host Age/Stage
Adult

Sex
Female

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod
Depleted

Time Held Alive before Inoculation

Collection Method
Aspirated from man

Collection Date
8/11/1963

Place Collected (Minimum of City, State, Country)
Pond "Mlynsky" near Lednice, S. Morovia

Latitude
48° 50' N

Longitude
16° 45' E

Macrohabitat
Pond area in lowland

Microhabitat
Reed thickets of littoral zone of fish pond

Method of Storage until Inoculated
Frozen on dry ice

Footnotes

Section III - Method of Isolation

Inoculation Date
8/13/1963

Animal (Details will be in Section 6)
nb mice

Route Inoculated
ic and sc

Reisolation
No

Other Reasons

Homologous Antibody Formation by Source Animal

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)
Stable at pH 7.2-10.4

Lipid Solvent (ether - % used to test) **20%**	After Treatment Titer **2.67 dex**	Control Titer **6.0 dex**
Lipid Solvent (chloroform) **5%**	After Treatment Titer **1.83 dex**	Control Titer **6.34 dex (2)**
Lipid Solvent (deoxycholate) **0.1, 0.2, or 0.3%**	After Treatment Titer **<1.0 dex**	Control Titer **5.0 dex**

Other (formalin, radiation)

Virion Morphology

Shape **Spherical or slightly oval**	Dimensions **80-105 nm**	
Mean nm	Range nm	
Measurement Method **Electron microscopy (21)**	Surface Projections/Envelope	Nucleocapsid Dimensions, Symmetry

Morphogenesis

Site of Constituent Formation in Cell	Site of Virion Assembly	Site of Virion Accumulation
Cytoplasm		
Inclusion Bodies	Other	

Hemagglutination

Hemaggiutination	Antigen Source	Erythrocytes (species used)
Yes	**SMB ext. by sucrose-acetone + sonication (7)**	**Goose**
pH Range	pH Optimum	
6.2-6.6	**6.4**	
Temperature Range	Temperature Optimum	
	37dC/60 min	

Remarks

Serologic Methods Recommended
HI, CF, NT, IFA

Footnotes

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

Identification test [1] using serum Lednice in dilutions 1:4 to 1:64 and 68 different arbovirus antigens in CF test were negative. Lednice antigen diluted 1:4 and 1:16 examined in CF test against 47 monotypic immune ascitic fluids or sera and 18 group polyvalent ascitic fluids or sera reacted positively only with polyvalent immune ascitic fluid containing antibodies against the arboviruses Anopheles A - Anopheles B - Turlock groups. Subsequently from all available antigens in the positive set, only the antigens of the Turlock group reacted with the Lednice serum. The results of final CF tests showed that Lednice and Yaba-1 viruses are close. The CF results were confirmed in the NT in mice.

Antigen	Antibody		
	Lednice	Yaba-1	DakBA 365
Lednice	128/256 *	16/128	8/128
Yaba 1	64/512	16/256	8/256
DakBA 365	64/32	16/16	8-16/32
Control antigen	0	0	0

Serum titer/antigen titer; 0 = <4/<4

The table below give NT results obtained by cross-testing Turlock serogroup viruses in Vero cells [22] . Neutralization titers represent serum dilution endpoints causing 90% plaque reduction.

Virus	Antibody to:				
	6118	MPO	Yaba-1	TUR	UMB
6118	1280	320	320	2560	40
M'Poko	160	10240	5120	5120	20
Yaba-1	160	2560	1280	1280	40
Turlock	40	80	40	2560	80
Umbre	80	640	40	1280	1280

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)	
Chick embryo (PC)	SM6	2-3	3+	4-5**					
Duck embryo (PC)		3	indistinct						
Duck embryo (PC)	SM6DE7	3	3+	5.5					
Goose embryo (PC)	SM6	3	indistinct	3.8					
Goose embryo (PC)	SM6GE4	3	3+	5.0					

** SM LD50/ml expressed in dex

See Reference 12

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
Culex modestus	1/12,177		S. Moravia, CZ; 1963 (1)
Culex modestus	6/15,820		S. Moravia, CZ; 1972 (1)
Anas platyrhynchos		22/69 HI	S. Moravia, CZ (11)
Anas platyrhynchos		2/15 HI	Danube delta, Romania (15)
Anser anser		11/64 HI	S. Moravia, CZ (11)
Anser anser		3/51 HI	Danube delta, Romania (15)

Cygnus olor		1/3 HI	S. Moravia, CZ (11)
Anas querquedula		3/11 HI	Danube delta, Romania (15)
Anas strepera		1/10 HI	
Anas craecca		2/11 HI	
Aythya ferina		0/16 HI	S. Moravia, CZ (11)
Netta rufina		0/14 HI	
Fulica atra		0/9 HI	
Fulica atra		1/11 HI	Danube delta, Romania (15)
Fulica cristata		1/7 HI	
Larus ridibundus		0/62 HI	S. Moravia, CZ (14)
Larus ridibundus		2/16 HI	Danube delta, Romania (15)
Goose		16/84 HI	S. Moravia, CZ (6, 8)
Duck		16/99 HI	
Small rodents		0/244 HI	S. Moravia, CZ (18)
Man		0/581 HI	S. Moravia, CZ(6, 14)
Cow		0/603 HI	
Horse		0/88 HI	
Sheep		0/50 HI	
Goat		0/5 HI	
Pig		0/124 HI	

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)	SM5, strain 110	ic	Death (3)	4-5	7.0
Mice (nb)		ip	No illness (3)		
Mice (nb)		sc	No illness (3)		
Mice (wn)		ic	Death (4)	6-10	
Mice (wn)		ip			
Mice (ad)		ic	Death in 80% (3)	10-13	
rats (nb)		ic	No illness (3)		
rats (ad)		ic	No illness (3)		
golden hamsters (100gm)		ic	No illness (3)		
guinea pigs (nb)	SM10, strain 110	ic	No illness (3)		
rabbits (1700gm)		ic	No illness (3)		
Macaca mulatta	SM2, strain 6118	sc	No viremia, antibody (10)		
Micromys minutus		sc	No viremia, antibody (18)		
Apodemus sylvaticus		sc	No viremia, antibody (18)		
Microtus arvalis		sc	No viremia, antibody (18)		
Cleth. glareolus		sc	No viremia, no antibody (18)		
chickens (nh)	SM14, strain 110	ic, in, sc	No illness (3)		
chickens (nh)	SM2, strain 6118	sc	Viremia, antibody (17)		
ducklings (nh)		sc, in, ic	Viremia, antibody (13)		
goslings (nh)		sc, in, ic	Viremia, antibody (13)		
pheasants (nh)		sc	Viremia, antibody (16)		
Larus ridibundus (nh)		sc	Viremia, antibody (19)		
Fulica atra L. (nb)		sc	Viremia, antibody (19)		
chick embryo	SM6, strain 110	CAC	Death (5)	3-4	4.0-5.0

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
Culex modestus 10 nb mouse brain suspension, or suspension diluted 10-2, 10-3, mixed with duck blood at a final dilution of 1:2, or 1:20(9).	+		14	23-24			1.1		ic nb mice
								saliv. glands	
	3.3		15	" "				0/17	ic nb mice and IFA
	4.3		15	" "				3/16	" "
	5.2		14	" "	ducks*	0/10		6/20	" "
	6.2		16	" "	ducks*	0/10		3/5	" "

* Newly hatched

Section X - Histopathology

Character of lesions (specify host)
Mouse: Meningoencephalitis. Pathological changes in spleen but not in other organs (heart, lungs liver, spleen, kidney, salivary glands, thymus, lymph nodes, bone marrow, and skeletal muscles) (3).

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)
Czechoslovakia (1,4); Romania (15)

Suspected (Antibody only detected)
South and Southeastern Europe (territory of Culex modestus)

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Remarks