

Status: Probable Arbovirus

Select Agent:

SALS Level: 2

SALS Basis: A7

Antigenic Group: Turlock Group

HEPA Filtration:

Taxonomic status: *Bunyavirus*

Other Information: None.

Section I - Full Virus Name and Prototype Number**Full Virus Name:****Prototype Number:****Lednice**

Strain 6118

Information from: Doubravka Malkova**Date:**

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8/31/1984

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

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Reviewed by editor

Section II - Original Source**Isolated by:** Malkova et al (1)**at:** Inst. Parasitology, Prague**Genus and species:** Culex modestus Fic., pool of 300 mosquitoes **Sentinel** X**Age/Stage:** Adult **Sex:** F

Isolated From	Isolation detail
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Signs and symptoms of illness:**Arthropod engorged depleted** X **gravid****Time held alive before inoculation:****Collection date:** 8/11/1963 **Method:** Aspirated from man**Place collected:** Pond "Mlynsky" near Lednice, S. Moravia**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 and Validity****Inoculation Date:** 8/13/1963**Animal:** nb mice **Embryonated egg:** **Tissue Culture:**

(Details in Section VI - Biologic Char.)

Route inoculated: ic and sc **Reisolation:** No**Other reasons:****Homologous antibody formation by** source animal (See Section II):**Test used:** HI CF NT**Other:****Footnotes:**

Section IV - Virus Properties

Physicochemical:

RNA: X DNA: Single Strand: Double Strand:
Pieces: Infectivity: Sedimentation coefficient(s): /strong>
Percentage wt. of virion protein , lipid carbohydrate
Virion polypeptides:
Number: Details:
Non-virion polypeptides:
Number: Details:
Virion density:
Nucleocapsid density Sedimentation coefficient:
Sedimentation coefficient:

Stability of infectivity (effects) pH Stable at pH 7.2-10.4

Lipid solvent:
(ether) 20% After treatment titer 2.67 dex Control titer 6.0 dex
(chloroform) 5% After treatment titer 1.83 dex Control titer 6. dex (2)
Detergent:
(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) how measured Electron microscopy (21)
Surface projections, envelope
Nucleocapsid dimensions, symmetry

Morphogenesis:

Site of constituent formation in cell Cytoplasm
Site of virion assembly
Inclusion bodies
Other

Hemagglutination:

Hemagglutination Yes Antigen source SMB ext. by sucrose-acetone + sonication (7)
Erthrocytes Goose pH range 6.2-6.6 pH optimum 6.4

Temperature optimum 37dC/60 min range

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

Susceptibility of Cell Culture Systems:

Cell system (a)	Virus passage history (b)	Evidence of Infection						
		CPE			PLAQUES		Growth Without CPE +/- (g)	
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)		
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

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 craqcca		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 (Record 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)		Transmission 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
		3.3	15	" "				saliv. glands	
		4.3	15	" "			0/17		ic nb mice and IFA
		5.2	14	" "	ducks*	0/10	3/16		" "
		6.2	16	" "	ducks*	0/10	6/20		" "
							3/5		" "

* Newly hatched

Section X - Histopathology

Character of lesions: 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:

Cytoplasmic:(M)

(LV)

Intranuclear: (M)

(LV)

Organs-tissues affected:

Category of tropism:

Section XI - Human Disease

Human disease:	In nature:	(S)	(R)
Death:	(S)	(R)	
Residua:	(S)	(R)	
Laboratory infections: Subclinical:	(S)	(R)	
Overt Disease:	(S)	(R)	
Clinical manifestations:			
Category:		No. of cases:	

Section XII - Geographic Distribution

Known (virus):

Czechoslovakia (1,4); Romania (15)

Suspected (antibody):

South and Southeastern Europe (territory of Culex modestus)

Section XIII - References

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Section XIV - Remarks
