

Virus Name: Israel turkey meningoencephalitis		Abbreviation: ITV
Status Probable Arbovirus	Select Agent No	SALS Level 3
SALS Basis Results of SALS surveys and information from the Catalogue.		
Other Information USDA Permit Required		
Antigenic Group B		

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation	Accession Number	Original Date Submitted 2/27/1985
Family Flaviviridae	Genus Flavivirus	
Information From J.S. Porterfield	Address National Institute for Medical Research, Mill Hill, London NW7 IAA, England	
Information Footnote Reviewed by editor		

Section II - Original Source

Isolated By (name) A. Komarov and E. Kalmar (1)	Isolated at Institute Veterinary Inst. Rishon-le-Zion, Israel	
Host Genus Domesticated turkeys (Meleagris gallopavo)	Species	Host Age/Stage Adult
Sex Not Answered		
<u>Isolated From</u>	<u>Isolation Details</u>	
Organs/Tissues	Brain and brain + liver and spleen	
Signs and Symptoms of Illness Progressive paralysis assoc. with non-purulent meningoencephalitis 10-12% mortality	Arthropod	
Time Held Alive before Inoculation		
Collection Method Organs removed from affected birds	Collection Date 9/1/1959	
Place Collected (Minimum of City, State, Country) Shomron district, Israel		
Latitude 31° 57' N	Longitude 34° 48' E	
Macrohabitat	Microhabitat	Method of Storage until Inoculated
Footnotes		

Section III - Method of Isolation

Inoculation Date
9/1/1959

Animal (Details will be in Section 6)
(Embryonated Egg)

Route Inoculated
ys, a.l.c., CAM

Reisolation
Yes

Other Reasons

Recovered birds resisted ic challenge with egg-passaged virus Turkeys affected in 1958 unaffected in 1959 outbreak.

Homologous Antibody Formation by Source Animal
Yes

Test(s) Used

Footnotes

Section IV - Virus Properties

Physicochemical
RNA

Pieces (number of genome segments)	Infectivity Yes (4)	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 <3.0 dex	Control Titer 7.0 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

Hemagglutination

Antigen Source

Erythrocytes (species used)

Yes

SMB ext. by fluorocarbon

Goose

pH Range

pH Optimum

6.0-6.8

6.4

Temperature Range

Temperature Optimum

4 - 37dC

22dC

Remarks

Serologic Methods Recommended

CF, NT

Footnotes

Plaque inhibition tests in chick embryo cell cultures

Virus	Antiserum	
	IT	Dengue 2, Ilheus, Langat, Iouping ill, JBE, Ntaya, Spondweni, Uganda S, West Nile, yellow fever, Zika
IT	18 mm *	0
Uganda S	0	
Zika	0	

* Diameter in mm of zone of plaque-inhibition

Plaque reduction tests in pig kidney cells (PS)

	IT	Tembusu	Ntaya
IT	1280	160	0
Tembusu	20	2560	0
Ntaya	640	0	640

No cross-neutralization with 39 other Group B antisera

In addition, see Reference [7].

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
CNS (LV), brain, liver, spleen pool (LV)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Weanling mice, embryonated eggs

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)	Titer PFU/ml (e)	
Chick embryo (PC)	P-6				3-4	Plaques		
PS (CL)					4-5	Plaques		
Vero (CL)	P-3				2	1 mm	7.3** (5)	
LLC-MK2 (CL)					4	2 mm	7.9 (5)	
** Expressed in dex								

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Turkey	3/3	3/6	Shomron, Israel
Turkey	1		South Africa (6)
Mosquitoes	1		Israel (8)
Culicoides	2		Israel (8)
Culex pipiens (engorged)	1		Israel (8)

Akov and Goldwasser (3) found HI antibody against Israel turkey virus in sera from wild birds, cattle, horses, rodents and bats in Israel; however, many of these results are probably due to West Nile antibody, which was also detected.

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log ₁₀ /ml
Mice (nb)		ic			
Mice (nb)	P-1	ip 0.03	Death	9-11	
Mice (nb)		sc			
Mice (wn)	P-3	ic 0.03	Death	6-8	4.0
Mice (wn)		ip			
guinea pig (ad)	Egg 17	ic	Nil		
hamster (ad)		ic	Nil		
				Died	Survived
turkey (ad)	Egg 5	ic		2	0
turkey (ad)		im		9	2
turkey		tracheal		0	2
turkey		contact		0	4
chicken (ad)	Egg 3	ic	Nil		
ducks (ad)		ic	Nil		
pigeon (ad)		ic	Nil		
chicken (1 day)		im		2	4
chicken (1 day)		ic		7	4
turkey		im, ic	Viremia as early as 24 hrs, persists 5-8 days (10).		

Mechanical transmission of virus occurs among fighting turkeys and Japanese quail. (11).

Section XIII - References

1. Komarov, A. and Kalmar, E. 1960. Vet. Record 72:257-261.
2. Porterfield, J.S. 1961. Vet. Record 73:392-394.
3. Akov, Y. and Goldwasser, R. 1966. Bull. World Health Organ. 34:901-909.
4. Nir, Y. 1970. Arch. ges Virusforsch. 29:215-221.
5. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
6. Barnard, B.J.H. 1980. Onderstepoort J. Vet. Res. 47:89-94.
7. De Madrid, A.T. and Porterfield, J.S. 1974. J. Gen. Virol. 23:91-96.
8. Braverman, Y. Kimron Vet. Inst., Beit Dagan, Israel. Unpublished data.
9. Nir, Y. 1972. Arch. ges. Virusforsch. 36:105-114.
10. Ianconescu, M. 1973. Avian Path. 2:251-261.
11. Ianconescu, M. 1975. Avian Path. 4:119-131.

Remarks