Virus Name: Tsuruse	Abbreviation: TSUV

Status
Possible Arbovirus

Select Agent
No

SALS Level
2

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

Other Information

Antigenic Group
Tete

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
Mag 271580

Accession Number

Original Date Submitted
8/3/1984

Family
Bunyaviridae

Genus
Bunyavirus

Information From
W.F. Scherer

Address
Cornell University Medical College, New York, New York

Information Footnote
Revised

Section II - Original Source

Isolated By (name)
Personnel 406 MGL

Isolated at Institute
Zama, Japan

Host Genus
Cyanopica cyanus (blue magpie)

Species

Host Age/Stage
Nestling

Sex
Not Answered

Isolated From	Isolation Details
Whole Blood	

Signs and Symptoms of Illness
None

Arthropod

Time Held Alive before Inoculation

Collection Method
Hand capture

Collection Date
8/4/1954

Place Collected (Minimum of City, State, Country)
Tsuruse, Japan (near Tokyo)

Latitude

Longitude

Macrohabitat

Microhabitat
Nest

Method of Storage until Inoculated

Footnotes

Section III - Method of Isolation

Inoculation Date

Animal (Details will be in Section 6)
wn mice

Route Inoculated
Intracerebral

Reisolation
Not tried

Other Reasons

Homologous Antibody Formation by Source Animal
Not tested

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)

Lipid Solvent (ether - % used to test) **25%**	After Treatment Titer **1.8 dex**	Control Titer **3.7 dex**
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate) **0.5%**	After Treatment Titer **<1.9 dex**	Control Titer **3.5 dex**

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions **>50, <100 nm**	
Mean nm	Range nm	
Measurement Method **Millipore filters, serial filtration**	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	Antigen Source	Erythrocytes (species used)
No	**SMB and livers ext. by sucrose-acetone**	**Goose**

pH Range	pH Optimum
5.8-6.8	

Temperature Range	Temperature Optimum
24dC	

Remarks
*** Growth of Tsuruse virus in primary chicken embryonic cell cultures was undiminished in the presence of iododeoxyuridine.**

Serologic Methods Recommended
CF, NT

Footnotes
*** Growth of Tsuruse virus in primary chicken embryonic cell cultures was undiminished in the presence of iododeoxyuridine.**

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

No antigenic relationship was demonstrated between Tsuruse and any of the following viruses:

Group A:	eastern encephalitis [c], Getah (Sagiyama) [c,d], Mayaro [d], Ndumu [a], Pixuna [a], Semliki forest [d], Sindbis [a,c,d], western encephalitis [a,c].
Group B:	dengue types 1 and 2 [d], Ilheus [d], Japanese encephalitis [c,d], LANGAT [c], Murray Valley encephalitis [d], Ntaya [d], Russian encephalitis [d], St. Louis encephalitis [c,d], Tembusu [d], Uganda S [d], West Nile [c,d], YELLOW FEVER [c], Zika [d].
Bunyamwera Group:	BATAI [c], Bunyamwera [a,c,d], Cache Valley [a,c], GERMISTON [c], GUAROA [a,c], ILESHA [b,c], KAIRI [c], SORONOCA [c], Wyeomyia [c,d].
Group C:	APEU [c], CARAPARU [c], ITAQUI [c], MADRID [c], MARITUBU [c], Murutucu [a,c], NEPUYO [c], Oriboca [a,c,d], OSSA [c].
Guama Group:	BIMITI [c], CATU [c], Guama [a,c,d], MOJU [c].
Capim Group:	Acara (b), BUSHBUSH [c], CAPIM [c], GUAJARA [c], MORICHE [c].
Simbu Group:	Akabane [a,b,d], Ingwavuma [b], Manzanilla [a], Sathuperi [b], Simbu [b].
Bwamba Group:	Bwamba [c,d], Pongola [b].
California Group:	California [c,d], LA CROSSE [c], MELAO [c], SNOWSHOE HARE [c], Tahyna (LUMBO) [a,c], TRIVITATTUS [c].
Anopheles A Group:	Anopheles A [b,c,d], Lukuni [b], Tacaiuma [a,b].

Phlebotomus Fever Group:	Anhanga [b,c], Bujaru [c], Candiru [b,c], Chagres [a,c], Icoaraci [a,b,c], Karimabad [c], Salehabad [c], ITAPORANGA [c], Naples [c], Sicilian [a,b,c].
Timbo Group:	Chaco [b], Timbo [b].
Changuinola Group:	Irituia [b], Ourem [b].
Vesicular Stomatitis Group:	Indiana [b,c], Piry [b], New Jersey; [c].
Tacaribe Group:	AMAPARI [c], JUNIN [c], Tacaribe [b,c].
Others:	Anopheles B [b,d], Corriparta [d], Mossuril [b], Palyam [b]. Quaranfil [b], Tete [b], Turlock [a], Wad Medani [b], Wongal [b]. Colorado tick fever [b,c], Hart Park [b], Jurona [b], Kern Canyon [b], Lebombo [b], Marco [b], Minnal [b], Navarro [b], Nodamura [c,d], Nyamanini [b], P422 [c], Pacui [b], Wanowrie [b], Witwatersrand [a,b].

[a,b] Arboviruses tested by HI and CF respectively against Tsuruse virus antiserum

[c,d] Arbovirus antisera tested against Tsuruse virus by CF and N methods respectively.

Capitalization signifies that the arbovirus antibody was in polyvalent group specific antiserum kindly supplied by Dr. R. Shope at Yale University and Dr. T. Work, while at CDC.

Mouse ascitic fluid prepared against Tsuruse virus reacted in HI and CF tests with members of the Tete group. By HI, acetone-extracted TSU MIAF inhibited 8 units of Bahig antigen to a titer of 160. TSu virus is distinct from other members of the group by CF [2] .

Relationships of Tete group viruses (3)

Virus/Antigen	Mouse Ascitic Fluids							
	CF				NT			
	Tete	Bahig	Matruh	Tsuruse	Tete	Bahig	Matruh	Tsuruse
Tete	256/256 [a]	16/64	0/0	32/256	1.7 [b]	2.2	2.1	2.0
Bahig	8/16	64/256	32/64	16/64	1.1	2.1	2.4	2.4
Matruh	8/4	128/16	64/4	32/4	0	>1.2	>2.9	>2.0
Tsuruse	16/64	16/64	0/0	512/256	0	1.7	>2.3	>2.9

[a] Antibody titer/antigen titer

[b] Log neutralization index in dex

Neutralization Relationships of Tete Group Viruses [1]

Viruses	Antibody				
	Tete	Batama	Bahig	Matruh	Tsuruse
Tete	0 [2]	2.2	>2.2	2.1	>0.9

Batama	0.8	0	>2.0	1.4	
Bahig	1.4	3.3	0	1.5	>0.5
Matruh	1.4	3.0	>0.4	0	
Tsuruse	1.7		0.4		0

[1] Data from Digoutte (1978, unpublished) and Downs (1973, unpublished). See Ref. .

[2] Difference of log neutralizing index from homologous in dex; see Table 3 .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
Blood (LV), liver (LV), kidney (LV), lung (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)		3-5	Slight CPE		2-3	Plaques			

Cell cultures SM 7-16 No CPE produced in fluid cultures of primary human amnion, primary monkey kidney, primary swine kidney, primary mouse embryo and continuous procine kidney.

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
Cyanopica cyanus	1		Tsuruse, Japan

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)	SM 7-16	ic 0.01	CNS symptoms	3-5	7.5
Mice (nb)		ip			
Mice (nb)		sc 0.02	None		
Mice (wn)		ic 0.03	CNS symptoms	3-7	
Mice (wn)		ip			
Mice (3-8 wk)		sc,ip,in 0.03	None		
hamsters (4-6 wk)		ic 0.03	CNS symptoms	4-7	
hamsters		sc 0.03	None		
chicks (1-3 day)		ic,ip,sc 0.03	None		
chicks (6 wk)		sc 0.03	None		
emb. eggs (7-8 day)		ys 0.01	Hemorrhagic embryos	3-7	
"" (9 day)		cam 0.02	None		

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 7 days after emergence	2.1-3.1 SMicLD50/ mosq.		10	27	Not tested		3.7 SMicLD50/mosq.		
		3.0-3.9 SMicLD50/ mosq.	3 serial passages over 35 days yielded 3.5-4.5 SMicLD50/mosq.						

Section X - Histopathology

Character of lesions (specify host)
Lymphocytic infiltration and perivascular cuffing in brain and spinal cord of hamsters inoculated ic: no lesions in other organs.

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism
Neurotropic

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)
Japan

Suspected (Antibody only detected)

Section XIII - References

1. Schaffer, P.A. and Scherer, W.F. 1972. Proc. Sco. Exp. Biol. Med. 139:1298-1304.
2. Director, Yale Arbovirus Research Unit. Personal communication. May, 1973.
3. Shope, R.E. and Downs, W.G. Personal communication. 1973.
4. Bishop, D.H.L. and Shope, R.E. In: Comprehensive Virology, Vol. 14, Chapter 1. H. Fraenkel-Conrat and R.R. Wagner, editors. Plenum Press, New York and London. 1979. p. 45.

Remarks