Virus Name: Dhori		Abbreviation: DHOV
Status **Possible Arbovirus**	Select Agent **No**	SALS Level **3**

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

Other Information

Antigenic Group
Ungrouped

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation	Accession Number	Original Date Submitted
611313		6/5/1984

Family	Genus
Orthomyxoviridae	

Information From	Address
Virus Research Centre	**20-A, Wellesley Road, Poona, India**

Information Footnote

Section II - Original Source

Isolated By (name)	Isolated at Institute	
C.R. Anderson (1,3)	**Virus Research Centre, Poona**	
Host Genus	Species	Host Age/Stage
Hyalomma dromedarii (pool of 100)		**Adult**

Sex
Female

Isolated From	Isolation Details
Signs and Symptoms of Illness	Arthropod

Time Held Alive before Inoculation

Collection Method	Collection Date
Removed from camels	**3/14/1961**

Place Collected (Minimum of City, State, Country)
Dhori, Kutch Dist., Gujarat State, India

Latitude	Longitude
23° 30' N	**69° 45' E**

Macrohabitat	Microhabitat	Method of Storage until Inoculated
Camel breeding farm	**Camel**	**In Revco at -50dC as whole ticks**

Footnotes

Section III - Method of Isolation

Inoculation Date
3/26/1961

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
RNA, Single Strand

Pieces (number of genome segments) **7 (6)**	Infectivity	Sedimentation Coefficients(s) (S)
Percentage wt, of Virion Protein	Lipid	Carbohydrate
Virion Polypeptides: Number **6**	Details **Nucleocapsid: vp54-56, MW 54-56 x 10\3/, matrix: vp28, MW 28 x 10\3/; glycoprotein: gp65, MW 65 x 10\6/; minor proteins: vp85, MW 85 x 10\3/; vp89, MW 89 x 10\3/; vp90, MW 90 x 10\3/ (6)**	
Non-virion Polypeptides: Number	Details	
Virion Density **1.16-1.18 gm/cm3 in glycerol-tartrate (6)**	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 **2.3 dex**	Control Titer **6.0 dex**

Other (formalin, radiation)

Virion Morphology

Shape **Spherical fliamentous particles**	Dimensions **92-110 nm (6)**

Mean nm	Range nm	
Measurement Method **Electron microscopy (6)**	Surface Projections/Envelope **Envelope present; surface projections 8-12nm long**	Nucleocapsid Dimensions, Symmetry

Morphogenesis

Site of Constituent Formation in Cell	Site of Virion Assembly	Site of Virion Accumulation
	Budding from cell surface plasma membrane (6)	**Interstitial spaces between cells (6)**
Inclusion Bodies	Other	

Hemagglutination

Hemaggiutination	Antigen Source	Erythrocytes (species used)
Yes	**Infected Vero cult. fl. tr.by Tween 80-ether (7).**	**Goose***
pH Range **6.0-7.0**	pH Optimum **6.0**	
Temperature Range	Temperature Optimum	

Remarks
Conc. by LKB filter; precipitation with PEG 6000; or sucrose centrifugation (7). * HA activity also demonstrated with sheep, monkey and human O erythrocytes(7).

Serologic Methods Recommended
HI, CF, NT

Footnotes
Conc. by LKB filter; precipitation with PEG 6000; or sucrose centrifugation (7). * HA activity also demonstrated with sheep, monkey and human O erythrocytes(7).

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

Dhori virus has been tested in neutralization test with the following antisera: dengue 1, 2, 3, 4, Japanese encephalitis, West Nile, Kyasanur Forest disease, Kaisodi, Batai (Chittor), Sathuperi, Sindbis, chikungunya, Umbre, and Chandipura, as well as several as yet unidentified viruses isolated at the Virus Research Centre, Poona. None of the antisera neutralized the Dhori virus.
At YARU, a Dhori virus immune serum of adequate titer has been tested against 31 other tick-borne viruses without any evidence of relationship. Also, Dhori virus antigen has been tested against 3 or 4 immune sera to other tick-borne agents without evidence of a relationship (Casals, J. 1970. Personal communication).

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)	
Ps (CL)		4	4+	5.5**	8	Plaques (4)			
Vero (CL)			CPE (7)		3	Plaques (6)			
BHK-21 (CL)			CPE		3	Plaques (6)			
LLC-MK2 (CL)			CPE		4-6	Plaques (6)			
BS-C-1 (CL)			No CPE (6)						
CV-1			No CPE (6)						

** 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
Hyalomma dromedarii	4/41 pools (5,234 ticks)		Kutch district, India
Hyalomma marginatum	1		Portugal (5)
Hyalomma dromedarii	1		Egypt (2)
Hyalomma p. plumbeum (= H. m. marginatum)	1		Volga River delta, USSR (3)
Dermacentor marginatus	1		Armenian SSR, USSR (8)
H. p. plumbeum (= H. m. marginatum)	1		Azerbaijan SSR, USSR (8)
Man		12/81	Saurashtra, India
Man		0/60	Kashmir, India
Sheep		0/20	Saurashtra, India
Cow		0/18	
Horse		4/20	
Camels		48/48 NT	India (7)
Horses		6/31 NT	
Cattle		0/52 NT	
Sheep		0/64 NT	
Goats		1/56 NT	
Dogs		0/5 NT	
Pigs		0/10 NT	

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)	P-5	ic 0.02	Death	2-3	7-8
Mice (nb)		ip 0.03	Death	3-4	6-8
Mice (nb)		sc			
Mice (wn)	P-7	ic 0.03	Death	3-4	7-8
Mice (wn)		ip 0.03	Death	5-6	
rabbits (ad)		ip 0.5	No viremia, antibody(3)		
rabbits (ad)		ic 0.1	Antibody		
embryonated eggs (10 day)		am.s.4-6 dex	No virus growth (6)		<3.0
""		al.c.4-6 dex	No virus growth (6)		<3.0

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

Section X - Histopathology

Character of lesions (specify host)

Inclusion Bodies: Intranuclear

Organs/Tissues Affected

Category of tropism

Section XI - Human Disease

In Nature: **Significant, Reported**

Residual

Death

Subclinical

Overt Disease

Clinical Manifestations
Acute febrile illness, 2/5 patients developed encephalitis (10).

Number of Cases
5

Category (i.e. febrile illness, etc.)
Febrile illness/encephalitis

Section XII - Geographic Distribution

Known (Virus detected)
India, Egypt, USSR, Portugal (5)

Suspected (Antibody only detected)

Section XIII - References

1. Subcommittee on Information Exchange. 1970. Catalogue of Arthropod-Borne Viruses of the World. Am. J. Trop. Med. and Hyg. (Supplement) 19:1089.
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Remarks

The complete nucleotide sequence of the fifth segment of single-stranded RNA of Dhori virus was determined. The data suggest that Dhori viruses are orthomyxoviruses but that they are more distantly related to the influenza viruses than type A, B, and C viruses are to each other. (9)