Virus Name: Hazara		Abbreviation: HAZV
Status **Possible Arbovirus**	Select Agent **No**	SALS Level **2**

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

Other Information

Antigenic Group
CHF-CON

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation	Accession Number	Original Date Submitted
JC 280		10/24/1984

Family	Genus
Bunyaviridae	**Nairovirus**

Information From	Address
F. Begum and C. Wisseman, Jr.	**Department of Microbioloby, 660 W. Redwood St. Baltimore, MD 21201 USA**

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)	Isolated at Institute	
Fatima Begum (1)	**Lahore, Pakistan**	
Host Genus **Ixodes redikorzevi**	Species	Host Age/Stage

Sex
Not Answered

Isolated From	Isolation Details
Signs and Symptoms of Illness	Arthropod

Time Held Alive before Inoculation

Collection Method	Collection Date
Ticks collected from trapped Alticola roylei	**7/20/1964**

Place Collected (Minimum of City, State, Country)
Gitidas, Hazara District, Pakistan

Latitude	Longitude
35° 7' N	**73° 59' E**

Macrohabitat	Microhabitat	Method of Storage until Inoculated
Kaghan Valley, elevation 12,500 ft.; subarctic terrain	**Alpine meadows**	**Frozen ampoules of ticks in liquid nitrogen cylinders at -196dC**

Footnotes

Section III - Method of Isolation

Inoculation Date
7/27/1964

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

Pieces (number of genome segments)

Infectivity

Sedimentation Coefficients(s) (S)

Percentage wt, of Virion Protein

Lipid

Carbohydrate

Virion Polypeptides: Number
4 (10)

Details
3 glycoproteins: 84,000 MW; 45,000 MW; 30,000 MW. Nucleocapsid polypeptide: 52,000 MW (10).

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
2.5 dex

Control Titer
7.2 dex

Lipid Solvent (chloroform)

After Treatment Titer

Control Titer

Lipid Solvent (deoxycholate)
1:100

After Treatment Titer
1.48 dex

Control Titer
4.5 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

Hemaggiutination	Antigen Source	Erythrocytes (species used)
Yes	**SMB ext. by sucrose-acetone**	**Goose**
pH Range	pH Optimum	
6.2-6.6	**6.4**	
Temperature Range	Temperature Optimum	
4dC,RT, 37dC	**37dC**	

Remarks
Low titered hemagglutinin produced, therefore cannot be used satisfactorily in HI tests.

Serologic Methods Recommended
CF, NT, HI

Footnotes
Low titered hemagglutinin produced, therefore cannot be used satisfactorily in HI tests.

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

Hyperimmune mouse serum to HAZ virus (homologous titer = 320) did not react in the HI test with 27 arbovirus antigens including 8 members of group A, 13 of group B, 4 of group C, and 2 others. HAZ hyperimmune mouse serum (homologous titer = 128) did not react in the CF test with antigens of 81 arboviruses, and of hepatoencephalitis virus and normal mouse brain [1] . HAZ virus found to be related to, but distinct from the Congo virus by NT and CF tests [2] , [3] , [5] , also by HI [4] .

A low-titered relationship by CF, IFA and indirect HA was demonstrated between CHF-CON and NSD viruses [6] , [7] . SIRACA has decided that these relations are no greater than those used to establish BUN Supergroup. The CHF-CON and NSD antigenic groups should be kept as two distinct serogroups.
Following the above observations, intergroup relationships were demonstrated for members of the above two serogroups as well as for members of the DGK, HUG, QYB and SAK serogroups [8] .

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Newborn and weanling 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)	
BHK-21 (CL)		15	No CPE		15	No plaques			

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
Ixodes redikorzevi*	1/2 pools		Hazara District, Pakistan
Man		4/150	Hazara District, Karachi, Lahore, and Dacca, Pakistan

* No further isolations of this virus were made from other genera of ticks (Dermacentor, Haemaphysalis) tested from Hazara district.

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)	SMB 6, Jc 280	ic 0.01	Paralysis, death	3-8	8.3
Mice (nb)		ip 0.03	Paralysis, death		6.8
Mice (nb)		sc			
Mice (wn)		ic 0.03	Paralysis, death		6.6
Mice (wn)		ip 0.05	Paralysis, death		2.5
guinea pigs (ad)		ip 0.5	Not infective		
hamsters (ad)		ip 0.5	Not infective		
hamsters (2 day)		ic 0.03	Paralysis, death	4-9	

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	Residual	Death
Subclinical	Overt Disease	

Clinical Manifestations

Number of Cases — Category (i.e. febrile illness, etc.)

Section XII - Geographic Distribution

Known (Virus detected)
West Pakistan

Suspected (Antibody only detected)

Section XIII - References

1. Begum, F., et al. 1970. Amer. J. Epidem. 92:180-191.
2. Begum, F., et al. 1970. Amer. J. Epidem. 92:192-194.
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4. Casals, J. and Tignor, G.H. 1974. Proc. Soc. Exp. Biol. Med. 145:960-966.
5. Buckley, S.M. 1974. Proc. Soc. Exp. Biol. Med. 146:594-600.
6. Davies, F.G. Personal communication. Nov. 1978.
7. Davies, F.G., et al. 1978. J. Comp. Path. 88:001-005.
8. Casals, J. and Tignor, G.H. 1980. Intervirology 14:144-147.
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Remarks

Classified as a member of the Nairovirus genus in the family Bunyaviridae (9).