

Virus Name: Hazara

Abbreviation: HAZV

Status: Possible Arbovirus

SALS Level: 2

Antigenic Group: CHF-CON

Taxonomic status: *Nairovirus*

Other Information: None.

Select Agent:

SALS Basis: S

HEPA Filtration:

Section I - Full Virus Name and Prototype Number

Full Virus Name:

Hazara

Prototype Number:

JC 280

Information from: F. Begum and C. Wisseman, Jr.

Date:

10/24/1984

Address: Department of Microbiology, 660 W. Redwood St. Baltimore, MD 21201 USA

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Reviewed by editor

Section II - Original Source

Isolated by: Fatima Begum (1)

at: Lahore, Pakistan

Genus and species: *Ixodes redikorzevi*

Sentinel X

Age/Stage: **Sex:**

Isolated From	Isolation detail
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Signs and symptoms of illness:

Arthropod engorged **depleted** **gravid**

Time held alive before inoculation:

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

Place collected: Gitidas, Hazara District, Pakistan

Latitude: 35° 7' " N

Longitude: 73° 59' " E

Macrohabitat: Kaghan Valley, elevation 12,500 ft.; subarctic terrain

Microhabitat: Alpine meadows

Method of storage until inoculated: Frozen ampoules of ticks in liquid nitrogen cylinders at -196dC

Footnotes:

Section III - Method of Isolation and Validity

Inoculation Date: 7/27/1964

Animal: nb mice

Embryonated egg:

Tissue Culture:

(Details in Section VI - Biologic Char.)

Route inoculated: Intracerebral

Reisolation: Yes

Other reasons:

Homologous antibody formation by source animal (See Section II):

Test used: HI

CF

NT

Other:

Footnotes:

Section IV - Virus Properties

Physicochemical:

RNA: DNA: Single Strand: Double Strand:
Pieces: Infectivity: Sedimentation coefficient(s): /strong>
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 coefficient:
Nucleocapsid density Sedimentation coefficient:

Stability of infectivity (effects) pH

Lipid solvent:
(ether) After treatment titer 2.5 dex Control titer 7.2 dex
(chloroform) After treatment titer Control titer
Detergent:
(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) how measured
Surface projections, envelope
Nucleocapsid dimensions, symmetry

Morphogenesis:

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

Hemagglutination:

Hemagglutination Yes Antigen source SMB ext. by sucrose-acetone
Erythrocytes Goose pH range 6.2-6.6 pH optimum 6.4
Temperature optimum 37dC range 4dC, RT, 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 hepatitis encephalitis 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

Susceptibility of Cell Culture Systems:

Cell system (a)	Virus passage history (b)	Evidence of Infection							Growth Without CPE +/- (g)
		CPE			PLAQUES				
		Day (c)	Extent (d)	Titer TC ₅₀ /ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)		
BHK-21 (CL)		15	No CPE		15	No plaques			

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
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 (Record Viremia)

Experimental host and age	Passage history and strain	Inoculation Route- Dose	Evidence of infection	AST (days)	Titer log ₁₀ /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	4-9	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		

Section IX - Experimental Arthropod Infection And Transmission

Arthropod species & virus source(a)	Method of Infection log ₁₀ /ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log ₁₀ /ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System

Section X - Histopathology

Character of lesions:

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):

West Pakistan

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.
3. Subcommittee on Information Exchange, 1970. Supplement to Catalogue of Arthropod-Borne Viruses of the World. Amer. J. Trop. Med. and Hyg. 19:1095-1096.
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.
9. Mathews, R.E.F. 1982. Intervirology 17:115-118.
10. Foulke, R.S., et al. 1981. J. Gen. Virol. 53:169-172.

Section XIV - Remarks

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