

Virus Name: Ibaraki

Abbreviation: IBAV

Status: Possible Arbovirus

SALS Level: 3

Antigenic Group: Epizootic Hemorrhagic Fever

Taxonomic status: *Orbivirus*

Other Information: None.

Select Agent:

SALS Basis: IE

HEPA Filtration:

Section I - Full Virus Name and Prototype Number

Full Virus Name:

Ibaraki

Prototype Number:

Ibaraki-2

Information from: T. Omori

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Date:

8/21/1984

Address: National Institute of Animal Health, Kodaira, Tokyo, Japan

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Reviewed by editor

Section II - Original Source

Isolated by: National Institute of Animal Health

at: Ibaraki Prefecture, Japan

Genus and species: Cattle

Sentinel X

Age/Stage: 10 years

Sex: F

Isolated From	Isolation detail
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Signs and symptoms of illness: Fever, anorexia, lacrimation, deglutitive difficulty, ulceration of oral nasal mucosa

Arthropod engorged

depleted

gravid

Time held alive before inoculation:

Collection date: 9/20/1959

Method: UNKNOWN

Place collected: Ibaraki Prefecture, Central parts of Japan

Latitude: 37° ' ' N

Longitude: 140° ' ' E

Macrohabitat: Open rice field

Microhabitat:

Method of storage until inoculated:

Footnotes:

Section III - Method of Isolation and Validity

Inoculation Date: 9/20/1959

Animal:

Embryonated egg:

Tissue Culture: X

(Details in Section VI - Biologic Char.)

Route inoculated:

Reisolation: Yes

Other reasons:

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

Test used: HI

CF X

NT X

Footnotes:

Section IV - Virus Properties

Physicochemical:

RNA: X DNA: Single Strand: Double Strand: X
Pieces: Infectivity: Sedimentation coefficient(s): /strong>
Percentage wt. of virion protein , lipid carbohydrate
Virion polypeptides:
Number: Details:
Non-virion polypeptides:
Number: Details:
Virion density: Sedimentation coefficient:
Nucleocapsid density Sedimentation coefficient:

Stability of infectivity (effects) pH Labile at pH 3.0; stable at pH 6.4

Lipid solvent:

(ether) 20% After treatment titer 4.8 dex Control titer 5.5 dex
(chloroform) 5% After treatment titer 5.8 dex Control titer 5.5 dex

Detergent:

(deoxycholate) 0.1% After treatment titer 6.2 dex Control titer 5.8 dex

Other (formalin, radiation): Sens. to trypsin, resistant to repeated freeze-thaw (4,6)

Virion morphology:

ShapeSpherical **Dimensions** 55 nm (9)
Mean (nm) 55 (9) **nrange (nm)** range 50-60 nm **how measured** Negative contrast
Surface projections, envelope Pseudo-envelope (9)
Nucleocapsid dimensions, symmetry Cubic T=3 (9); Capsomere=32 (9)

Morphogenesis:

Site of constituent formation in cell Cytoplasm (9)
Site of virion assembly Budding from cell membrane, intracytoplasmic viral matrices (9)
Inclusion bodies
Other Tubular structures in cytoplasm (9)

Hemagglutination:

HemagglutinationNo **Antigen source** Inf. bovine kidney cell cult. fl. Acetone-ether ext. SMB
Erythrocytes Many* **pH range** 7.2 **pH optimum**
Temperature optimum **range** 37dC, 22dC, 4dC
Remarks * Cattle, horse, sheep, goat, guinea pig, mouse and chicken erythrocytes tested
Serologic methods recommended NT, CF
Footnotes: * Cattle, horse, sheep, goat, guinea pig, mouse and chicken erythrocytes tested

Section V - Antigenic Relationship And Lack of Relationship To Other Viruses

No evidence of a serological relationship between Ibaraki virus and bluetongue virus was recognized. Cross neutralization was not observed and cross complement-fixation was not shown between Ibaraki and bluetongue, type 10 [4] , [6] . By CF, sheep antisera to bluetongue, types 1-16 which reacted with bluetongue, type 10 antigen, were negative with Ibaraki antigen [4] . Studies conducted elsewhere, employing neutralization tests in mice, BHK-21 and other cell culture systems, complement-fixation, and ferritin tagged antibody, also confirmed a lack of antigenic relationship between Ibaraki and bluetongue viruses [10] . Two-way cross relationships between Ibaraki virus and EHD virus, serotypes 1 and 2, demonstrated by agar gel precipitin and indirect fluorescent antibody tests [12] . By neutralization tests, Ibaraki virus was more closely related to EHD virus, serotype 2 ("Alberta strain"). Antigenic relationship not observed between Ibaraki virus and four serotypes of bluetongue found in USA.

Section VI - Biologic Characteristics

Virus source (all VERTEBRATE isolates):

Lab Methods of Virus Recovery (ALL ISOLATIONS): Newborn mice, bovine embryo kidney-BEK, calf kidney, calf passage to BEK (3,4)

Susceptibility of Cell Culture Systems:

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)	
Bovine embryo kidney (BEK) (PC)	1	21-50	3+ (3)					
Sheep kidney (PC)	10	5	3+	5.8**				
Hamster kidney (PC)	1	5	3+	5.5				
BHK-21 (CL)	1	5	3+	5.8				
Chick embryo (PC)	1	4	2+	5.5				

** Expressed in dex

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
Cattle (blood)	5/15	764/1,312 NT	Ibaraki Prefecture, Japan (4)

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 log10/ml
Mice (nb)	Ibaraki-2,10th	ic	Death	3-4.5	7.5
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)		ic	Survival		
Mice (wn)		ip			
calves (1-2 yr)	Ibaraki-5,1st	iv, ocular instillation, mucous membrane scarification.	Virus serially passed 7-8 times in calves by iv inoc. of blood. Fever, leukopenia consistently observed. In other instances additional signs of the disease were observed (2, 4).		
eggs (4-5 day)	Kyushu-1	iv			
rabbits (yg ad)	Ibaraki-2, 1st	ys	Death (4, 8)		
		iv, ic	Survival, no antibody (4, 8)		

guinea pigs (wn)

ic, ip, in

Survival, no antibody (4, 8)

sheep

iv

No pathogenicity, low infectivity (4, 8)

