

Virus Name: Bakau

Abbreviation: BAKV

Status: Possible Arbovirus

SALS Level: 2

Antigenic Group: Bakau

Taxonomic status: *Bunya-like*

Other Information: None.

Select Agent:

SALS Basis: S

HEPA Filtration:

Section I - Full Virus Name and Prototype Number

Full Virus Name:

Bakau

Prototype Number:

MM-2325

Information from: Elisberg/Buescher

Date:

1/25/1985

Address: Dept. of Virus Diseases, WRAIR, Washington, D.C. 20012

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Reviewed by editor

Section II - Original Source

Isolated by: US Army Med. Res. Unit (1) **at:** Kuala Lumpur, Malaya

Genus and species: Culex (Lophoceratomyia) spp. **Sentinel** X

Age/Stage: Adult **Sex:** F

Isolated From	Isolation detail
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Signs and symptoms of illness:

Arthropod engorged depleted gravid

Time held alive before inoculation:

Collection date: 1/25/1956 **Method:** From human subjects

Place collected: Rantau Panjang, Malaysia

Latitude: 3° 3' " N

Longitude: 101° 23' " E

Macrohabitat: Coastal Nipah palm-mangrove swamp

Microhabitat: Small clearing in swamp, remote from human habitation

Method of storage until inoculated: Held alive for 72 hours

Footnotes:

Section III - Method of Isolation and Validity

Inoculation Date: 1/28/1956

Animal: nb mice

Embryonated egg:

Tissue Culture:

(Details in Section VI - Biologic Char.)

Route inoculated: Intracerebral

Reisolation: No

Other reasons: No identical strain in laboratory at time of original isolation

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:	Details:		
Non-virion polypeptides:			
Number:	Details:		
Virion density:		Sedimentation coefficient:	
Nucleocapsid density		Sedimentation coefficient:	

Stability of infectivity (effects) pH

Lipid solvent:		
(ether)	After treatment titer	Control titer
(chloroform) 1:20	After treatment titer <4.6 dex	Control titer 8.6 dex
Detergent:		
(deoxycholate) 1:1000	After treatment titer <4.6 dex	Control titer 8.6 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	Antigen source SM serum ext. by acetone-ether	
Erthrocytes Chicks	pH range 5.0-6.0	pH optimum 5.6
Temperature optimum 27dC	range 4dC, 27dC, 37dC	
Remarks	HA antigen also prepared from infected suckling mouse brain by sucrose-acetone method (1)	
Serologic methods recommended	HI, CF, NT	
Footnotes:	HA antigen also prepared from infected suckling mouse brain by sucrose-acetone method (1)	

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

Bakau Antigen/Virus					
Immune Serum	HI		CF		NT
	Ht/Ho	Ratio	Ht/Ho	Ratio	Ht/Ho
Ketapang	<10/640	>1/64	20/320	1/16	0.1/3.3

Bakau Immune Serum					
Antigen/Virus	HI		CF		NT
	Ht/Ho	Ratio	Ht/Ho	Ratio	Ht/Ho
Ketapang	<10/160	>1/16	80/80	1	0.4/>5.1

HI Tests: Bakau antigen not inhibited by group immune guinea pig sera for Groups A, B, C, and Bunyamwera [2] .

Bakau immune sera did not react with antigens from eastern, western and Venezuelan equine encephalitis, Mayaro, Semliki, Ilheus, Ntaya, yellow fever, Murray Valley encephalitis, St. Louis, Marituba, Oriboca, Caraparu, Bunyamwera, Cache Valley and Guaroa viruses [2] .

CF Tests: Bakau antigens did not react with immune sera from Mayaro, western equine encephalitis, chikungunya, Ilheus, Japanese encephalitis, RSSE, Murray Valley encephalitis, Murutucu, Caraparu, Bunyamwera, Chittoor, Guaroa, Kairi, Wyeomyia, California encephalitis, and Rift Valley fever viruses.

Section VI - Biologic Characteristics
Virus source (all VERTEBRATE isolates): Blood (LV)

Lab Methods of Virus Recovery (ALL ISOLATIONS): Newborn mice

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)	
Vero (CL)	P-10				4	2 mm	6.7* (5)	
LLC-MK2 (CL)					3	1 mm	7.0 (5)	
BHK-21 (CL)	MB 9	2-3	4+	8.0* (6)				

* 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 used
Cx (Lop) spp.	1/7 pools (1,563 mosquitoes)		Rantau Panjang, Malaysia
Argas abdussalami	18/19		Lahore, West Pakistan (3)
Man		14/97 NT	Kuala Lumpur, Malaysia
Man		21/74 NT	Kuantan, Malaysia
Man		20/98 NT	Rantau Panjang, Malaysia
Culex sp. No. 1	2		Malaysia (4)
Culex sp. No. 3	1		
Wild Macaca fascicularis (blood)	1		

NT: >1.8 dex neutralizing antibody considered positive

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)	SMB 9	ic 0.015	Death	4	9.1
Mice (nb)		ip			
Mice (nb)		sc			
Mice (wn)	SMB 6	ic 0.03	Death	5	7.3
Mice (wn)		ip			
rabbit (ad)		ip 1.0x4	Neutralizing antibody		

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):

Malaysia; Pakistan (3)

Section XIII - References

1. Inst. Med. Res., Kuala Lumpur, Malaysia. 1957. Unpublished results.
2. Rockefeller Foundation Virus Laboratories, New York. 1960. Unpublished results.
3. Subcommittee on Information Exchange, ACAV. 1970. Am. J. Trop. Med. Hyg. 19:1083.
4. Rudnick, A. Personal communication. April 1972.
5. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
6. Karabatsos, N. and Buckley, S.M. 1967. Am. J. Trop. Med. Hyg. 16:99-105.

Section XIV - Remarks
