

Virus Name: Bushbush

Abbreviation: BSBV

Status: Arbovirus

SALS Level: 2

Antigenic Group: Capim

Taxonomic status: *Bunyavirus*

Other Information: None.

Select Agent:

SALS Basis: S

HEPA Filtration:

Section I - Full Virus Name and Prototype Number

Full Virus Name:

Bushbush

Prototype Number:

TRVL 26668

Information from: Trinidad Req. Virus Lab

Date:

2/2/1985

Address: P.O. Box 164, Port of Spain, Trinidad

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Reviewed by editor

Section II - Original Source

Isolated by: TRVL (1)

at: Port of Spain, Trinidad

Genus and species: *Culex (Aedinus) accelerans* (792 mosquitoes)

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: 10/6/1959 **Method:** Human bait

Place collected: Nariva County, Trinidad

Latitude: 10° 24' " N

Longitude: 61° 3' " W

Macrohabitat: Bush Bush Forest, eastern Trinidad

Microhabitat: Semi-evergreen seasonal forest and swamp forest

Method of storage until inoculated: Held alive overnight ambient temp.; then at -55dC until processed

Footnotes:

Section III - Method of Isolation and Validity

Inoculation Date: 10/13/1959

Animal: nb mice

Embryonated egg:

Tissue Culture:

(Details in Section VI - Biologic Char.)

Route inoculated: Intracerebral

Reisolation: No

Other reasons: No other strains of this virus have been isolated by this laboratory

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)	After treatment titer	Control titer
Detergent:		
(deoxycholate)	After treatment titer <2.5 dex	Control titer 5.6 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:

HemagglutinationNo	Antigen source SMB ext. by acetone-ether; sucrose-acetone	
Erthrocytes Goose	pH range	pH optimum
Temperature optimum	range	

Remarks HA has been prepared by the Belem Virus Lab from SMB of strain BeAn 20076 by the sucrose-acetone technique (7).
Serologic methods recommended CF, NT
Footnotes: HA has been prepared by the Belem Virus Lab from SMB of strain BeAn 20076 by the sucrose-acetone technique (7).

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

- HI: Hyperimmune mouse serum versus Bushbush does not inhibit hemagglutination of: EEE, WEE, VEE, Mayaro, SLE, Ilheus, yellow fever, dengue, Catu, Guama, Moju. (The test with Catu, Guama and Moju was done by the Belem Virus Laboratory.)
- CF: Crude saline antigen of mouse brain did not fix complement in the presence of mouse hyperimmune sera prepared with the following agents: Kairi, Ieri, Tacaiuma, Murutucu, SLE, Aruac, Anopheles A, Itaquí, Cache Valley, Nepuyo, Turlock, Caraparu, Bimiti, Tacaribe, Bwamba, Simbu, Wyeomyia, EEE, Rift Valley fever, Catu, Melao, WEE, Bunyamwera, Sindbis, Oropouche, VEE, Oriboca, Guama, Lukuni, Manzanilla, Marituba, EMC, Trinita, Guaroa, Apeu, GD VII.

Bushbush mouse hyperimmune serum did not fix complement with the following sucrose-acetone antigens: Guama, Catu, Moju, Capim, An 20525, but reacted to 1/4 of homologous titer with Guajara. (This test was done at the Belem Virus Laboratory.)
Strain BeAn 20076 from Belem is closely related to TRVL 26668 by CF, but cannot be assumed identical until further testing is done [7] .

- NT: Bushbush in baby mice ic test was neutralized slightly by Bimiti and Catu hyperimmune mouse sera (about 1/3 of homologous neutralization).

SIRACA has antigenically classified Bushbush virus as the prototype virus of the Bushbush complex, one of five complexes comprising the Capim serogroup. The registered Benfica virus and an unregistered virus were judged to be subtypes of Bushbush virus [8] .

Section VI - Biologic Characteristics

Virus source (all VERTEBRATE isolates):

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)	
Mouse embryo (PC)	P-13					Plaques (4)		
Vero (CL)					6	1 mm	4.8* (6)	
LLC-MK2 (CL)					1	1 mm	7.7 (6)	
No evidence of multiplication in hamster kidney (PC) and KB (CL) cell cultures.								
* 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
Sentinel mouse	7		IAN Forest, Belem, Brazil
Sentinel mouse	15		Para, Brazil (2, 3)
Culex (Ads) accelerans	1/7,000 pools		Bush Bush Forest, Trinidad
Culex spp.	1		Para, Brazil (2, 3)

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)	MB 10	ic 0.02	Death	3-5	5.6
Mice (nb)		ip 0.03	Death	5-7	>5.0
Mice (nb)		sc			
Mice (wn)	MB 13	ic 0.03	Death	10	<1.0
Mice (wn)		ip 0.2	No mortality		
embryonated eggs			No multiplication		

Section IX - Experimental Arthropod Infection And Transmission

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmission by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
Two transmissions by naturally infected Culex spp., Para, Brazil (2,3).									
Ae aegypti and Cx quinquefasciatus inoculated parenterally, carried strain TRVL 26668 through five serial salivary gland passages (5).									

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):

Trinidad,Brazil

Section XIII - References

1. Spence, L., et al. 1967. Proc. Soc. Exp. Biol. Med. 125:45.
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5. Whitman, L. Personal communication. 1972.
6. Stim, T.B. 1969. J. Gen. Virol. 5:329-338.
7. Shope, R.E. Personal communication. 1964.
8. Calisher, C.H., et al. 1985. Intervirology. To be submitted.

Section XIV - Remarks
