

Virus Name: Johnston Atoll		Abbreviation: JAV
Status Arbovirus	Select Agent No	SALS Level 2
SALS Basis Results of SALS surveys and information from the Catalogue.		
Other Information		
Antigenic Group Quaranfil		

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation	Accession Number	Original Date Submitted 10/20/1984
Family Not listed	Genus Not listed	
Information From C.M. Clifford and L. Thomas	Address Rocky Mountain Laboratory, Hamilton, Montana 59840	
Information Footnote Reviewed by editor		

Section II - Original Source

Isolated By (name) Gene Hughes (1)	Isolated at Institute Rocky Mountain Laboratory	
Host Genus Ornithodoros capensis	Species	Host Age/Stage
Sex Not Answered		
<u>Isolated From</u>	<u>Isolation Details</u>	
Signs and Symptoms of Illness	Arthropod	
Time Held Alive before Inoculation		
Collection Method	Collection Date 4/26/1964	
Place Collected (Minimum of City, State, Country) Sand Island, Johnston Atoll, Pacific Ocean		
Latitude 18° N	Longitude 169° W	
Macrohabitat	Microhabitat Common nobby tern nest	Method of Storage until Inoculated Room temp. humidity jar at 75-80% R.H.
Footnotes		

Section III - Method of Isolation

Inoculation Date
5/1/1964

Animal (Details will be in Section 6)
nb mice

Route Inoculated Intracerebral	Reisolation Not tried
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Other Reasons
The only other virus in laboratory at isolation was Hughes virus.

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	Details	
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) 1:4	After Treatment Titer 2.5 dex	Control Titer 5.5 dex
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate)	After Treatment Titer	Control Titer
Other (formalin, radiation)		

Virion Morphology

Shape Arenavirus-like (10)	Dimensions 155--170 nm	
Mean 160 nmnm	Range nm	
Measurement Method EM (10)	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

Hemagglutination Antigen Source Erythrocytes (species used)
No **SMB ext. by sucrose-acetone** **Chick**

pH Range pH Optimum
6.0-7.0

Temperature Range Temperature Optimum

Remarks

Serologic Methods Recommended
CF, NT

Footnotes

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

Johnston Atoll antigen was tested by CF against mouse sera of listed viruses. Fixation was demonstrated only with Quarafil.

Group A:	Chikungunya, Eastern equine encephalitis, Mayaro, Sindbis, Una, Uruma, western equine encephalitis, Highlands-J.
Group B:	Bussuquara, dengue 4, dengue 2, Jap. B., Kunjin, Langat, Modoc, Murray Valley encephalitis, Powassan, Rio Bravo, St. Louis encephalitis, Uganda S, yellow fever, Zika.
Group C:	Apeu, Itaqui.
Anopheles A Group:	Anopheles A.
Bunyamwera Group:	Bunyamwera, Cache Valley, Germiston, Guaroa, Wyeomyia.
California Group:	Tahyna.
Koongol Group:	Koongol.
Quarafil Group:	Quarafil.
Phlebotomus Fever Group:	Sandfly fever Sicilian.
Tacaribe Group:	Junin.
Anopheles B Group:	Anopheles B.
Bluetongue Group:	Bluetongue.

Colorado Tick Fever Group:	Colorado tick fever.
Hughes Group:	Hughes.
Kaisodi Group:	Silverwater.
Kemerovo Group:	Chenuda, Kemerovo, Wad Medani.
Mapputta Group:	Mapputta.
Mouse Viruses:	GD-7.
Misc.:	J.F. Bell's Myotis volans virus (MVV), Hughes.

Johnston Atoll serum was tested against following antigens with no complement fixation:

Group A:	eastern equine encephalitis, western equine encephalitis.
Group B:	Dengue 1, dengue 2, Jap. B, Langat, Powassan, St. Louis encephalitis.
Bunyamwera Group:	Bunyamwera.
Hughes Group:	Hughes.

Antigen	CF Done at RML Serum		Casals, Personal commun. Serum	
	Johnston Atoll	Quaranfil	Johnston Atoll	Quaranfil
Johnston Atoll	64/32	8/16	128+/128+	16/32
Quaranfil	0/0	256/8	64/8	128/16
Normal	0/0	0/0	0	0

Antibody titer/antigen titer; 0/0, 0 = <4/<4

Results of Neutralization Tests (NT Done at RML). Dex Protection in 3-4 day-old mice.

Antigen	Immune Serum			
	Johnston Atoll	Quaranfil	Hughes	Raza-Hughes

Johnston Atoll	3.0	3.0	0	1.0
Quaranfil	2.75	3.75	0	0
Hughes	.57	.82	2.96	1.72
Raza-Hughes	.50	.75	1.50	1.9

Johnston Atoll and Abal viruses indistinguishable by CF and NT (J. Casals, Personal communication, 1973).

Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Newborn mice

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)	
LLC-MK2 (CL)					8	1 mm	4.1* (2)	

* Expressed in dex

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Ornithodoros capensis	1/2 (pools)		Sand Island, Johnston Atoll; Central Pacific
O. capensis	1 [*] /1000		Queensland, Australia (4)
O. capensis	10/200 (pools) (4,016 ticks)		North Island, New Zealand (6, 7, 8)
Sula serrator (Gannets)		18/40 NT	New Zealand (7, 8)
O. capensis	1		Mana Island, Hawaii; USA (9)
* Abal strain			

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log ₁₀ /ml
Mice (nb)	SM 4	ic 0.02	Death 30/30	4-5	7.25
Mice (nb)		ip 0.05	Scattered deaths 4/30	7-9	7.25
Mice (nb)		sc			
Mice (wn)		ic 0.05	Death 17/18	6-9	7.25
Mice (wn)		ip 0.05	Survived		
chicks (48 hr)		ic 0.03	Death 15/15	4-5	6.0
chicks after		ip 0.1	Death 11/15	4-7	6.0
chicks hatching)		sc 0.1	Death 12/15	4-7	6.0
chicks hatching		ic, ip, sc	Viremia - range from <1-3.36		
sooty terns (juvenile) (caught wild)	SM4-5	sc 0.1	Viremia (3)		<1.15
noddy terns (juvenile)		sc 0.1	Viremia (3)		<1.15

Section XIII - References

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6. Director, Queensland Inst. Med. Res. Personal communication. 1973.
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8. Austin, F.J. 1978. Am. J. Trop. Med. Hyg. 27:1045-1048.
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10. Zeller, H. et al. 1989. I. Arch. Virol. Submitted.

Remarks

Abal virus is synonym for Johnston Atoll virus.