Virus Name: Qalyub	Abbreviation: QYBV

Status
Arbovirus

Select Agent
No

SALS Level
2

SALS Basis
Results of SALS surveys and information from the Catalogue.

Other Information

Antigenic Group
Qalyub

SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
Ar 370

Accession Number

Original Date Submitted
10/23/1984

Family
Bunyaviridae

Genus
Nairovirus

Information From
R.M. Taylor (1)

Address
University of Calif., School of Public Health, Berkeley, California 94720, USA

Information Footnote
Reviewed by editor

Section II - Original Source

Isolated By (name)
R.M. Taylor and H.R. Dressler

Isolated at Institute
NAMRU-3, Cairo, Egypt

Host Genus
Ornithodoros erraticus

Species

Host Age/Stage

Sex
Not Answered

Isolated From

Isolation Details

Signs and Symptoms of Illness

Arthropod

Time Held Alive before Inoculation

Collection Method
By hand

Collection Date
8/28/1952

Place Collected (Minimum of City, State, Country)
Qalyub, Qalyubiya Province, Egypt

Latitude
30° N

Longitude
32° E

Macrohabitat
Highly cultivated and irrigated area in Nile Delta

Microhabitat
Rat nest in wall of old tomb in village cemetery

Method of Storage until Inoculated
Ambient temp. in vial

Footnotes

Section III - Method of Isolation

Inoculation Date
8/28/1952

Animal (Details will be in Section 6)
nb mice

Route Inoculated
sc and ic

Reisolation
No

Other Reasons
Different from any other virus in laboratory

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) **20%**	After Treatment Titer **<1.0 dex**	Control Titer **6.9 dex**
Lipid Solvent (chloroform)	After Treatment Titer	Control Titer
Lipid Solvent (deoxycholate)	After Treatment Titer	Control Titer

Other (formalin, radiation)

Virion Morphology

Shape	Dimensions	
Mean nm	Range nm	
Measurement Method	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

Hemaggiutination	Antigen Source	Erythrocytes (species used)
No	**SMB ext. by acetone-ether**	**Goose**
pH Range **6.0-6.8**	pH Optimum	
Temperature Range **37dC**	Temperature Optimum	

Remarks
Tests performed by J. Casals

Serologic Methods Recommended
CF

Footnotes
Tests performed by J. Casals

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

Immune serum of Ar 370 failed to inhibit hemagglutination of 8 units of following antigens: chikungunya, o'nyong-nyong, Semliki, Sindbis, dengue virus, type 2, Ntaya, Spondweni, Uganda S, Wesselsbron, West Nile, yellow fever, Zika, Caraparu, Bunyamwera, Ilesha and Bwamba.
Immune serum Ar 370 (homologous CF titer 256), failed to fix complement with antigens of following viruses: Acara, Anopheles B, Aruac, Farallon, Navarro, Chaco, Chenuda, Colorado tick fever, Corriparta, epizootic hemmorhagic disease of deer (NJ), Hart Park, Hughes, Dugbe, Ieri, Ganjam, Bhanja, Wanowrie, Venkatapuram, Ichampadi, Palyam, Minnal, Johnston Island, Jurona, Kaisodi, Kemerovo (R 10), Kern Canyon, Koongol, Lagos bat, Klamath, M 1146, Lanjam, Mapputa, Marco, MARU 21343, Mirim, Mossuril, Nyamanini, Pacui, Manawa, Lahore, Tehran, Piry, Quaranfil, SAAn 136, SAAn 4511, Sawgrass, Semunya, Silverwater, Simbu, Soldado, Tacaiuma, Tembe, Thogoto, Tribec, Triniti, Turlock, Umbre, Uukuniemi, vesicular stomatitis Indiana and Wad Medani.
Also, no positive fixation with the following nonarbovirus antigens: Ectromelia, herpesvirus, lymphocytic choriomeningitis, mouse encephalo- myocarditis, mouse polioencephalitis (GD 7), Newcastle disease, rabies and reovirus type 3.
However, Ar 370 is related to Bandia virus, as shown by the following cross CF tests:

	Serum	
Antigen	**Ar 370**	**Bandia**
Ar 370	256/512	4/32
Bandia	16/512	64/512+

Serum titer/antigen titer

We are indebted to Dr. J. Casals [3] for the above recorded information. Also see Bandia virus registration in Catalogue.

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	
		Day (c)	Extent (d)	Titer TCD50/ml (e)	Day (c)	Size (f)	Titer PFU/ml (e)	+/- (g)	
Rabbit kidney (PC)	SM 10		CPE (5)						

Section VII - Natural Host Range (Additional text can be added below table)

Vertebrate (species and organ) and arthropod	No. isolations/No. tested	No. with antibody/No. tested Test used	Country and region
Ornithodoros erraticus More than 1600 pools of several species of ticks and other arthropods were collected in Egypt and tested at NAMRU-3 without isolation of another virus corresponding to Ar 370.	1/43		Egypt
O. eraticus	4/1,530		Egypt (4)
Arvicanthis nitolicus		18/131 CF	
Man		1.5%/191 CF	Lower Egypt (6)
Camels		6/137 CF	
Buffalo		2/108 CF	
Pigs		12/101 CF	
Dogs		4/101 CF	
Donkeys		8/107 CF	
Rodents		1/94 CF	
Sheep		0/100 CF	

Section VIII - Susceptibility to Experimental Infection (include viremia)

Experimental host and age	Passage history and strain	Inoculation Route-Dose	Evidence of infection	AST (days)	Titer log10/ml
Mice (nb)	SM 8	ic	Paralysis and death	6-7	6.9
Mice (nb)		ip	Paralysis and death		7.0
Mice (nb)		sc			
Mice (wn)		ic	Negative		
Mice (wn)		ip			
embryonated eggs (7 day)		ys 0.2	Death	4-8	
"" (7 day)	emb. egg 3	ys 0.2	Death; titer in mice		>4.5

Section IX - Experimental Arthropod Infection and Transmission

Arthropod species & virus source(a)	Method of Infection log10/ml (b)		Incubation period (c)		Transmision by bite (d)		Assay of arthropod, log10/ml (e)		
	Feeding	Injected	Days	°C	Host	Ratio	Whole	Organ	System
O. erraticus (adult)	SMB 8 .001/10-7; after 14 days failed to transmit by bite and no virus detected in coxal fluid. However, after 25 days titer of virus in the ticks exceeded 3.0 dex. Orally infected O. erraticus (2 males, 1 female) trans. virus to SM after 30 days extrinsic incubation. First nymphs, orally inf. as larvae, failed to trans. virus individually, but trans. virus to SM when fed on mice in groups of 11-20/mouse (7).								

Section X - Histopathology

Character of lesions (specify host)
In mice: ic inoculation produced marked neuron chromatolysis, cystic degeneration and some cuffing. Occasional pneumonitis and degeneration of liver.

Inclusion Bodies — Intranuclear

Organs/Tissues Affected
Brain (LV), lungs (LV), liver (LV)

Category of tropism

Section XI - Human Disease

In Nature	Residual	Death
Subclinical	Overt Disease	
Clinical Manifestations		
Number of Cases	Category (i.e. febrile illness, etc.)	

Section XII - Geographic Distribution

Known (Virus detected)
Nile Delta, Egypt

Suspected (Antibody only detected)

Section XIII - References

1. Subcommittee on Information Exchange, ACAV. Supplement to Catalogue of Arthropod-borne Viruses of the World. 1970. Am. J. Trop. Med. and Hyg. 19:1115-1116.
2. Casals, J. 1970. Misc. Publ. Ent. Soc. Am. 6:327.
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5. Attia, M.A.M. 1970. Acta Virol. 14:145-149.
6. Darwish, M.A., et al. 1975. J. Egypt Pub. Hlth. Assoc. 50:37-42.
7. Miller, B.R., et al. 1985. Am. J. Trop. Med. Hyg. 34:180-187.

Remarks

This strain (Ar 370) was apparently lost in 1956 before it was adequately compared with other arboviruses, but was revived by H.R. Dressler in 1967 from ampules that had been sent to Naval Research Institute in Bethesda. It was with this recovered strain that the more complete antigenic comparison with other arboviruses was made. Further studies on transmission by ticks should be made before it is definitely accepted as an arbovirus, but its antigenic relation to Bandia virus, isolated on several occasions from Ornithodoros ticks as well as from rodents in West Africa, suggests that both of these viruses may be transmitted by ticks.