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|--|---------------------------|---------------------------|
| Virus Name: Warrego | | Abbreviation: WARV |
| Status Possible Arbovirus | Select Agent No | SALS Level 2 |
| SALS Basis Results of SALS surveys and information from the Catalogue. | | |
| Other Information | | |
| Antigenic Group Warrego | | |

SECTION I - Full Virus Name and Prototype Number

| | | |
|--|---|--|
| Prototype Strain Number / Designation Ch9935 | Accession Number | Original Date Submitted 11/19/1984 |
| Family Reoviridae | Genus Orbivirus | |
| Information From R.L. Doherty | Address Queensland Institute of Medical Research, Brisbane, Q4006, AS | |
| Information Footnote Reviewed by editor | | |

Section II - Original Source

| | | |
|---|--|---|
| Isolated By (name) R.L. Doherty, et al. | Isolated at Institute Brisbane | |
| Host Genus Culicoides spp. | Species | Host Age/Stage Adult |
| Sex Female | | |
| <u>Isolated From</u> | <u>Isolation Details</u> | |
| Signs and Symptoms of Illness | Arthropod | |
| Time Held Alive before Inoculation | | |
| Collection Method Light trap | Collection Date 2/13/1969 | |
| Place Collected (Minimum of City, State, Country) Charleville, Queensland, Australia | | |
| Latitude 26° 10' S | Longitude 145° 50' E | |
| Macrohabitat Near Charleville, 965 feet, ann. rain 19.47 inches; open eucalypt forest and grassland | Microhabitat Light trap near Warrego River on edge of town | Method of Storage until Inoculated Overnight at 5dC, transported on liquid nitrogen, then at -60dC in Revco |
| Footnotes | | |

Section III - Method of Isolation

Inoculation Date
3/26/1969

Animal (Details will be in Section 6)
nb mice

Route Inoculated
Intracerebral

Reisolation
Yes

Other Reasons

Other isolations from Culicoides and mosquitoes collected in same region and period.

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) 50% final | After Treatment Titer 4.5 dex | Control Titer 3.8 dex |
| Lipid Solvent (chloroform) | After Treatment Titer | Control Titer |
| Lipid Solvent (deoxycholate) 1:1000 final | After Treatment Titer 3.5 dex | Control Titer 3.9 dex |
| Other (formalin, radiation) | | |

Virion Morphology

| | | |
|---|--|---|
| Shape Spherical; polygonal | Dimensions 67 + 4; 71 + 4 nm | |
| Mean nm | Range nm | |
| Measurement Method Thin-section; neg contrast electron microscopy (4) | Surface Projections/Envelope | Nucleocapsid Dimensions, Symmetry Core = 38 + 3 nm: obvious |

Morphogenesis

| | | |
|---------------------------------------|-------------------------|-----------------------------|
| Site of Constituent Formation in Cell | Site of Virion Assembly | Site of Virion Accumulation |
| Inclusion Bodies | Other | |

Hemagglutination

| | | |
|-------------------------------|--|---|
| Hemagglutination No | Antigen Source SMB, blood ext. by sucrose-acetone + protamine tr., sonication or trypsin | Erythrocytes (species used) Goose |
|-------------------------------|--|---|

| | |
|----------------------------|------------|
| pH Range 6.0-7.6 | pH Optimum |
|----------------------------|------------|

| | |
|-------------------|---------------------|
| Temperature Range | Temperature Optimum |
|-------------------|---------------------|

Remarks

Serologic Methods Recommended
CF

Footnotes

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

Studies at Queensland Institute of Medical Research:

No antigenic relationship was detected by complement-fixation or neutralization tests between Ch9935 antigen or antiserum and the following arboviruses or suspected arboviruses isolated or available in Australia: Group A (Sindbis, Ross River, Getah, Bebaru); Group B (Murray Valley encephalitis, Kunjin, Kokobera, Edge Hill, Stratford, Alfuy, JBE, SLE, dengue types 1, 2, 3, and 4); Koongol group (Koongol, Wongal); Mapputta group (Mapputta, Trubanaman, MK7532); Quarantil group (Abal); Simbu group (Akabane, Aino [Samford]); Corriparta group (Corriparta); Eubenangee group (Eubenangee); Others (Kowanyama, Almpiwar, Upolu, ephemeral fever, Belmont, Wallal, Charleville, Wongorr and Ngaingan). Relationship to Mitchell River virus (MRM10434 strain), first observed by the International Reference Centre, was confirmed:

| Immune Serum or Antigen | Ch9935 Antigen | | | Ch9935 Immune Serum | | |
|----------------------------|----------------|-------|---------|---------------------|-------|---------|
| | CF | | NT | CF | | NT |
| | Ht/Ho | Ratio | Ht/Ho | Ht/Ho | Ratio | Ht/Ho |
| Mitchell River (MRM 10434) | <8/64 | <1/8 | 0.8/1.5 | 8/>128 | 1/>16 | 1.3/3.2 |
| NT: LNI in dex. | | | | | | |

Studies at International Reference Centre, Yale Arbovirus Unit:

Comparison by complement-fixation test with 24 solvent-resistant arboviruses [3] showed two Australian strains Ch9935 and MRM10434 were related to each other but distinct from others tested.

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)
Weanling 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) | | | |
| PS (CL) | SMB 3 | | | | | Plaques | 6.1* | | | |
| BHK-21 (CL) | | | CPE | >5.0 * | | | | | | |
| Vero (CL) | | | CPE | >5.0 | | | | | | |
| VSW (CL) | | | CPE | >5.0 | | | | | | |
| * Expressed in dex | | | | | | | | | | |

| Vertebrate (species and organ) and arthropod | No. isolations/No. tested | No. with antibody/No. tested Test used | Country and region |
|---|------------------------------|---|---|
| Culicoides spp. | 6/25,894 | | Charleville, Queensland, AS, 1969-70 (1) |
| Wallaby | | 12/30 | Queensland, AS (1) |
| Kangaroo | | 8/21 | |
| Cattle | | 7/62 | |
| Various vertebrate species | | 2/346 | |
| Culicoides marksi | 1 | | Charleville, Queensland, AS (1) |
| C. marksi | 1 | | Beatrice Hill, No. Terr., AS (5) |
| C. dycei | 1 | | Charleville, Queensland, AS (1) |
| Anopheles meraukensis | 1 | | Kowanyama, Queensland, AS (6) |
| Cx annulirostris | 1 | | Charleville, Queensland, AS (1) |

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) | SMB 3 | ic 0.015 | Death | 3-4 | 6.7 |
| Mice (nb) | | ip 0.03 | No overt signs of infection | | <3.5 |
| Mice (nb) | | sc | | | |
| Mice (wn) | | ic 0.03 | No overt signs of infection | | <3.5 |
| Mice (wn) | | ip 0.1 | Antibody production | | |

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 |
| Aedes aegypti, SMB 5 | Intrathoracically inoculated with 0.0006 ml (3 experiments 0.3-1.2 log10 per mosquito). Assay of virus content by titration in infant mice. Initial eclipse with no virus detectable at 0.5-1 days; increase to 3.9->5.8 log10 10-20 days after inoculation. (2) | | | | | | | | |

Section X - Histopathology

Character of lesions (specify host)

Inclusion BodiesIntranuclear

Organs/Tissues Affected

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)

Charleville, Queensland, Australia

Suspected (Antibody only detected)

Section XIII - References

1. Doherty, R.L., et al. 1973. Trans. R. Soc. Trop. Med. and Hyg. 67:536-543.
2. Carley, J.G., et al. 1973. J. Med. Ent. 10:244-249.
3. Borden, E.C., et al. 1971. J. Gen. Virol. 13:261-271.
4. Schnagl, R.D. and Holmes, I.H. 1971. Aust. J. Biol. Sci. 24:1151-1162.
5. Mahoney, D.F., Chief, CSIRO Div. Animal Hlth. Personal communication. 1983.
6. Doherty, R.L., et al. 1979. Aust. J. Exp. Biol. Med. Sci. 57:509-520.

Remarks