

|                                                                                  |                           |                           |
|----------------------------------------------------------------------------------|---------------------------|---------------------------|
| <b>Virus Name: Spondweni</b>                                                     |                           | <b>Abbreviation: SPOV</b> |
| Status<br><b>Arbovirus</b>                                                       | Select Agent<br><b>No</b> | SALS Level<br><b>3</b>    |
| SALS Basis<br><b>Results of SALS surveys and information from the Catalogue.</b> |                           |                           |
| Other Information                                                                |                           |                           |
| Antigenic Group<br><b>B</b>                                                      |                           |                           |

**SECTION I - Full Virus Name and Prototype Number**

|                                                         |                                                                                              |                                             |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------|
| Prototype Strain Number / Designation<br><b>SAAr 94</b> | Accession Number                                                                             | Original Date Submitted<br><b>10/5/1984</b> |
| Family<br><b>Flaviviridae</b>                           | Genus<br><b>Flavivirus</b>                                                                   |                                             |
| Information From<br><b>B.M. McIntosh</b>                | Address<br><b>National Institute for Virology, P/Bag X4, Sandringham, 2131, South Africa</b> |                                             |
| Information Footnote<br><b>Revised</b>                  |                                                                                              |                                             |

**Section II - Original Source**

|                                                                                             |                                                                      |                                                                                          |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Isolated By (name)<br><b>R.H. Kokernot, et al. (1)</b>                                      | Isolated at Institute<br><b>S. Afr. Ins. Med. Res., Johannesburg</b> |                                                                                          |
| Host Genus<br><b>Mansonia uniformis</b>                                                     | Species                                                              | Host Age/Stage<br><b>Adult</b>                                                           |
| Sex<br><b>Female</b>                                                                        |                                                                      |                                                                                          |
| <u>Isolated From</u>                                                                        | <u>Isolation Details</u>                                             |                                                                                          |
| Signs and Symptoms of Illness                                                               | Arthropod                                                            |                                                                                          |
| Time Held Alive before Inoculation<br><b>One day</b>                                        |                                                                      |                                                                                          |
| Collection Method<br><b>By hand off human bait and vegetation</b>                           | Collection Date<br><b>5/2/1955</b>                                   |                                                                                          |
| Place Collected (Minimum of City, State, Country)<br><b>Lake Simbu, Natal, South Africa</b> |                                                                      |                                                                                          |
| Latitude<br><b>27° S</b>                                                                    | Longitude<br><b>32° E</b>                                            |                                                                                          |
| Macrohabitat<br><b>Tropical, coastal lowland, savannah woodland</b>                         | Microhabitat                                                         | Method of Storage until Inoculated<br><b>Mosquito suspension on wet ice for 24 hours</b> |
| Footnotes                                                                                   |                                                                      |                                                                                          |

**Section III - Method of Isolation**

Inoculation Date  
**5/4/1955**

Animal (Details will be in Section 6)  
**nb mice**

|                                          |                          |
|------------------------------------------|--------------------------|
| Route Inoculated<br><b>Intracerebral</b> | Reisolation<br><b>No</b> |
|------------------------------------------|--------------------------|

Other Reasons  
**Multiple isolations later from mosquitoes**

Homologous Antibody Formation by Source Animal

Test(s) Used

Footnotes

**Section IV - Virus Properties**

**Physicochemical**

|                                    |                                      |                                      |
|------------------------------------|--------------------------------------|--------------------------------------|
| Pieces (number of genome segments) | Infectivity                          | Sedimentation Coefficients(s)<br>(S) |
| Percentage wt, of Virion Protein   | Lipid                                | Carbohydrate                         |
| Virion Polypeptides: Number        | Details                              |                                      |
| Non-virion Polypeptides: Number    | Details                              |                                      |
| Virion Density                     | Sedimentation Coefficients(s)<br>(S) |                                      |
| Nucleocapsid Density               | Sedimentation Coefficients(s)<br>(S) |                                      |

**Stability of Infectivity (effects)**

pH (infective range)

|                                        |                       |               |
|----------------------------------------|-----------------------|---------------|
| Lipid Solvent (ether - % used to test) | After Treatment Titer | Control Titer |
| Lipid Solvent (chloroform)             | After Treatment Titer | Control Titer |
| Lipid Solvent (deoxycholate)           | After Treatment Titer | Control Titer |
| Other (formalin, radiation)            |                       |               |

**Virion Morphology**

|                    |                              |                                   |
|--------------------|------------------------------|-----------------------------------|
| Shape              | Dimensions                   |                                   |
| Mean<br>nm         | Range<br>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**

Hemagglutination                      Antigen Source                      Erythrocytes (species used)  
**Yes**                      **SMB extracted with sucrose-acetone**                      **Goose**

pH Range                      pH Optimum  
**6.0-6.8**                      **6.5**

Temperature Range                      Temperature Optimum

Remarks

Serologic Methods Recommended  
**HI, CF, NT**

Footnotes

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

| Antigens or Antibodies | SPO Antigen<br>CF(2) | SPO Antibody<br>CF(2) |
|------------------------|----------------------|-----------------------|
| Bagaza                 | 4                    | 64                    |
| Ntaya                  | 64                   | 64                    |
| West Nile              | >256                 | >1024                 |
| Usutu                  | 16                   | >1024                 |
| Koutango               | 16                   | 256                   |
| Banzi                  | 64                   | 256                   |
| Uganda S               | 64                   | >1024                 |
| Bouboui                | 64                   | 256                   |
| Saboya                 | >128                 | 128                   |
| Zika                   | 8                    | 32                    |
| Wesselsbron            | 128                  | 256                   |
| Dengue 1               | 32                   | 64                    |

|              |      |       |
|--------------|------|-------|
| Yellow fever | >128 | >1024 |
| Dakar bat    | 32   | >1024 |

Results expressed as quotient of homologous/heterologous titers.

In cross PRNT against 42 flaviviruses SPO virus reacted with Zika and St. Louis encephalitis virus [3] .

| Viruses or Antisera | SPO Virus | SPO Antibody |
|---------------------|-----------|--------------|
| Zika                | 1280/<20  | 160/80       |
| St. Louis Enc.      | 1280/<20  | 160/40       |

Results = homologous/heterologous titers.

Placed with Zika virus in the Spondweni serological subgroup [4] . In a later cross-neutralization study involving 60 registered and 5 unregistered flaviviruses, SPO virus did not cross-react and could not be placed in a complex [24] .

Virus Source (all VERTEBRATE isolates)

Lab Methods of Virus Recovery (ALL ISOLATIONS)  
Newborn mice

| Cell system<br>(a) | Virus passage<br>history (b) | Evidence of Infection |               |                       |            |             |                     |                                  |
|--------------------|------------------------------|-----------------------|---------------|-----------------------|------------|-------------|---------------------|----------------------------------|
|                    |                              | CPE                   |               |                       | PLAQUES    |             |                     | Growth Without<br>CPE<br>+/- (g) |
|                    |                              | Day<br>(c)            | Extent<br>(d) | Titer TCD50/ml<br>(e) | Day<br>(c) | Size<br>(f) | Titer PFU/ml<br>(e) |                                  |
| PS (CL)            | MB 9                         |                       |               |                       | 6          |             | 8.0* (5)            |                                  |
| LLC-MK2<br>(CL)    |                              |                       |               |                       | 8          | 2-3<br>mm   | 7.3 (6)             |                                  |
| LLC-MK2<br>(CL)    | MB 6                         |                       |               |                       | 4          | 1 mm        | 7.6 (7)             |                                  |
| MA-104 (CL)        |                              |                       |               |                       | 7          | 1 mm        | 6.4 (6)             |                                  |
| PS-C1 (CL)         |                              |                       |               |                       | 6          | 3 mm        | 6.5 (6)             |                                  |
| Vero (CL)          |                              |                       |               |                       | 13         | 1-3<br>mm   | 5.7 (7)             |                                  |

\* Expressed in dex

| Vertebrate (species and organ) and arthropod | No. isolations/No. tested | No. with antibody/No. tested<br>Test used | Country and region      |
|----------------------------------------------|---------------------------|-------------------------------------------|-------------------------|
| Man (lab infection)                          | 1                         |                                           | South Africa (8)        |
| Man                                          | 1                         |                                           | Nigeria (9, 10)         |
| Man                                          | 1                         |                                           | Cameroun (11)           |
| Man                                          |                           | 34/1,839 NT                               | South Africa (12, 13)   |
| Man                                          |                           | 35/858 NT                                 | Mozambique (14)         |
| Man                                          |                           | 20/492 NT                                 | Angola (15)             |
| Man                                          |                           | 9/323 NT                                  | Okavango, Botswana (16) |
| Man                                          |                           | 5/120 NT                                  | Caprivi, Namibia(16)    |
| <i>Mansonia uniformis</i>                    | 1                         |                                           | South Africa (1)        |
| <i>Aedes circumluteolus</i>                  | 20                        |                                           | South Africa (2, 8, 17) |
| <i>Mansonia africana</i>                     | 4                         |                                           | South Africa (8, 17)    |
| <i>Aedes cumminsii</i>                       | 1                         |                                           |                         |
| <i>Eretmapodites silvestris</i>              | 1                         |                                           |                         |
| <i>Culex neavei</i>                          | 1                         |                                           | South Africa (17)       |
| <i>Aedes fryeri/fowleri</i>                  | 1                         |                                           | Lumbo, Mozambique (19)  |
| <i>Eretmapodites</i> spp.                    | 1                         |                                           | Cameroun (20)           |

| Experimental host and age | Passage history and strain | Inoculation Route-Dose | Evidence of infection | AST (days) | Titer log <sub>10</sub> /ml |
|---------------------------|----------------------------|------------------------|-----------------------|------------|-----------------------------|
| Mice (nb)                 | Ar 94                      | ic                     | Death                 | 4          | 8.4                         |
| Mice (nb)                 |                            | ip                     |                       |            |                             |
| Mice (nb)                 |                            | sc                     |                       |            |                             |
| Mice (wn)                 |                            | ic                     | Death                 |            |                             |
| Mice (wn)                 |                            | ip                     | None                  |            |                             |
| vervet monkey             |                            | ic                     | Antibody              |            |                             |
| guinea pig                |                            | ic                     | Antibody              |            |                             |
| rabbit                    |                            | ic                     | Antibody              |            |                             |
| chick (1 day)             |                            | iv                     | Antibody              |            |                             |
| wild rodents (6 species)  |                            | iv                     | None (22)             |            |                             |
| man                       |                            | sc                     | Viremia (21)          |            |                             |

**Section IX - Experimental Arthropod Infection and Transmission**

| Arthropod species & virus source(a) | Method of Infection log <sub>10</sub> /ml (b) |          | Incubation period (c) |    | Transmission by bite (d) |                                                                                              | Assay of arthropod, log <sub>10</sub> /ml (e) |       |        |
|-------------------------------------|-----------------------------------------------|----------|-----------------------|----|--------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------|-------|--------|
|                                     | Feeding                                       | Injected | Days                  | °C | Host                     | Ratio                                                                                        | Whole                                         | Organ | System |
| Aedes circumluteolus                | 7.1                                           |          | 30-84                 | 26 | mice                     | Groups of mosquitoes transmitted to mice on days 30, 37, 42, 56, 63, 70, 77, and 84 (18,23). |                                               |       |        |

**Section X - Histopathology**

Character of lesions (specify host)

Inclusion Bodies

Intranuclear

Organs/Tissues Affected

Category of tropism

**Section XI - Human Disease**

In Nature  
**Reported**

Residual  
**Reported**

Death

Subclinical

Overt Disease  
**Reported**

Clinical Manifestations

**Fever, headache, body pains, weakness, nausea, epistaxis**

Number of Cases

**Five (two laboratory infections (8,9,21,25))**

Category (i.e. febrile illness, etc.)

**Febrile illness**

**Section XII - Geographic Distribution**

Known (Virus detected)

**South Africa (1, 8, 17, 18), Nigeria (9)ABC STARMARKERXYZ, Cameroun (20), Mozambique (19)**

Suspected (Antibody only detected)

**Angola (15), Botswana (16), Namibia (16)**

## Section XIII - References

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## Remarks

\* Originally reported as a strain of Zika (10).