| Virus Name: Chandipura | Abbreviation: CHPV |
|---|---|

Status
**Arbovirus**

Select Agent
**No**

SALS Level
**2**

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

Other Information

Antigenic Group
**Vesicular Stomatitis**

## SECTION I - Full Virus Name and Prototype Number

Prototype Strain Number / Designation
**653514**

Accession Number

Original Date Submitted
6/5/1984

Family
**Rhabdoviridae**

Genus
**Vesicuovirus**

Information From
**The Virus Research Centre, Poona, India**

Address
**Yale Arbovirus Research Unit**

Information Footnote
**Revised by R.B.Tesh**

## Section II - Original Source

Isolated By (name)
**Staff, Virus Research Centre**

Isolated at Institute
**Poona, India (1)**

Host Genus
**Man**

Species

Host Age/Stage
**Adult**

Sex
**Female**

| Isolated From | Isolation Details |
|---|---|
| **Serum/Plasma** | |

Signs and Symptoms of Illness
**Chills, fever, myalgia, arthralgia, vomiting and weakness (1)**

Arthropod

Time Held Alive before Inoculation

Collection Method
**Venipuncture**

Collection Date
**6/10/1965**

Place Collected (Minimum of City, State, Country)
**Chandipura, Nagpur City, Maharashtra, India**

Latitude
**21° 10' N**

Longitude
**79° 12' E**

Macrohabitat
**Rural community**

Microhabitat

Method of Storage until Inoculated
**At -50dC and on dry ice for last 12 hours**

Footnotes

## Section III - Method of Isolation

Inoculation Date
**6/12/1965**

Animal (Details will be in Section 6)
**nb mice, BS-C-1 (cells) (Tissue Culture)**

Route Inoculated
**Intracerebral**

Reisolation
**Yes**

Other Reasons

Homologous Antibody Formation by Source Animal
**Yes**

Test(s) Used
**NT**

Footnotes

## Section IV - Virus Properties

Physicochemical
**RNA, Single Strand**

Pieces (number of genome segments)
**1**

Infectivity
**No**

Sedimentation Coefficients(s)
**38-45**(S)

Percentage wt, of Virion Protein
**protein 60-70%**

Lipid
**lipid 20-25%**

Carbohydrate
**3-13%, RNA: 0.7-5.0%**

Virion Polypeptides: Number
**5**

Details
**M (MW 150-200 x 10\3/), G (64 x 10\3/), N (54 x 10\3/), M (27 x 10\3/), NS (29-45 x 10 \3/) (2,3)**

Non-virion Polypeptides: Number
**0**

Details

Virion Density
**1.18-1.20 in sucrose**

Sedimentation Coefficients(s)
**625 (2)**(S)

Nucleocapsid Density
**1.32 in CsCl**

Sedimentation Coefficients(s)
**140**(S)

---

**Stability of Infectivity (effects)**

pH (infective range)
**Unstable at pH 3.0; stable in range pH 5-10**

| | | |
|---|---|---|
| Lipid Solvent (ether - % used to test) | After Treatment Titer | Control Titer |
| Lipid Solvent (chloroform) | After Treatment Titer<br>**4.5 dex** | Control Titer<br>**>10.5 dex (1)** |
| Lipid Solvent (deoxycholate)<br>**1:200** | After Treatment Titer<br>**<4.0 dex** | Control Titer<br>**>9.0 dex (1)** |

Other (formalin, radiation)
**Inactivated by ultraviolet light and x-radiation**

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**Virion Morphology**

Shape
**Bullet-shaped (3)**

Dimensions
**180 x 75 nm**

Mean
nm

Range
nm

| Measurement Method | Surface Projections/Envelope | Nucleocapsid Dimensions, Symmetry |
|---|---|---|
| **Electron microscopy** | **Surf. proj. 6-10 nm; bilayer lipid membrane (2)** | **Extended 3.5 nm; helical 30-35 turns; 49nm outer,** |

**Morphogenesis**

| Site of Constituent Formation in Cell | Site of Virion Assembly | Site of Virion Accumulation |
|---|---|---|
| **Cytoplasm (2)** | **Buds from plasma membrane** | **Extracellular and in cytoplasmic vesicles** |
| Inclusion Bodies | Other | |
| **Not usually** | | |

**Hemagglutination**

| Hemaggiutination | Antigen Source | Erythrocytes (species used) |
|---|---|---|
| **No** | **SMB ext. by sucrose-acetone + prot.** | **Goose**** |
| pH Range | pH Optimum | |
| **6.0-6.8** | | |
| Temperature Range | Temperature Optimum | |
| | **24-37dC** | |

Remarks
**Sucrose and acetone preparations with varying concentrations of protamine sulfate tried unsuccessfully (1) ** Human O erythrocytes also tried.**

Serologic Methods Recommended
**CF, NT**

Footnotes
**Sucrose and acetone preparations with varying concentrations of protamine sulfate tried unsuccessfully (1) ** Human O erythrocytes also tried.**

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

CF Tests [5]

| | Hyperimmune mouse sera or ascitic fluid | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Antigens** | **VSNJ** | **VSI** | **COC** | **PIRY** | **CHP** | **FLA** | **HP** | **Mokola** | **Rabies** | **LB** | **MEB** | **KC** | **KLA** |
| VSNJ | 256/512[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VSI | 0 | 256/512 | 32/128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| COC | 0 | 32/512 | 256/512 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PIRY | 0 | 0 | 0 | 128/32 | 8/4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CHP | 0 | 0 | 0 | 0 | 128/64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FLA | 0 | 0 | 0 | 0 | 0 | 64/16 | 32/4 | 0 | 0 | 0 | 0 | 0 | 0 |
| HP | 0 | 0 | 0 | 0 | 0 | 32/16 | 256/64 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mokola | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 256/512 | 32/32 | 0 | 0 | 0 | 0 |
| Rabies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32/128 | 1024/512 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rabies | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32/128 | 1024/512 | 0 | 0 | 0 | 0 |
| LB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64/128 | 64/128 | 8/128 | 0 | 0 | 0 |
| MEB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64/64 | 0 | 0 |
| KC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 256/512 | 0 |
| KLA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 256/6 |
| Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

VSNJ (VS-New Jersey), VSI (VS-Indiana), COC (Cocal), CHP (Chandipura), FLA (Flanders), HP (Hart Park), LB (Lagos bat), MEB (Mt. Elgon bat), KC (Kern Canyon), KLA (Klamath).

[a] Serum titer/antigen titer; 0 = <4/<4

| | | NT [5] | | | | | Plaque NT [6] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Titer-dex | | | | | | | Virus | | | | | |
| Virus | LD50 | VSI | COC | VSNJ | PIRY | CHP | Immune Serum | VSNJ | VSI | COC | PIRY | CHP | ISF |
| VSI | 7.1 | 6.2[b] | 4.2 | 1.9 | 0 | 2.6 | VSNJ | 10240[c] | <10 | <10 | <10 | <10 | <10 |
| COC | 7.7 | 4.2 | >7.0 | 2.7 | 1.7 | 1.8 | VSI | <10 | 327680 | 320 | <10 | <10 | <10 |
| VSNJ | 5.5 | 2.2 | 0 | >5.0 | 0 | 0 | COC | <10 | 160 | 5120 | <10 | <10 | <10 |
| | | | | | | | VSA | <10 | 20 | 20 | <10 | <10 | <10 |
| PIRY | 7.9 | 2.3 | 2.6 | 2.5 | 5.7 | 3.4 | PIRY | <10 | <10 | <10 | 163840 | 80 | <10 |
| CHP | 7.3 | 2.5 | 2.7 | 0 | 4.6 | >5.7 | CHP | <10 | <10 | <10 | <10 | 10240 | <10 |
| | | | | | | | ISF | <10 | <10 | 40 | <10 | <10 | 163840 |

[b] LNI in dex; 0 = 1.5 or less

[c] Reciprocal of highest serum dilution producing >95% plaque inhibition.

See References [5] and [7] for additional PRNT results.

## Section VI - Biologic Characteristics

Virus Source (all VERTEBRATE isolates)
**Blood (M), liver (LV)**

Lab Methods of Virus Recovery (ALL ISOLATIONS)
**Newborn mice and BS-C-1 cell cultures (1)**

| 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) | |
| BS-C-1 (CL) | Few | 1 | 4+ | >11.6* (1) | | | | | |
| Monkey kidney(PC) | Few | 1 | 4+ | >11.6 (1) | | | 11.2* | | |
| Chick embyro(PC) | Few | 1 | 4+ | 10.5 (1) | | | | | |
| Vero (CL) | | 1 | 4+ | | 2 | 2-3 mm | 8.0 | | |
| PS (CL) | SM22, Vero 2 | 1 | 4+ | | 1 | 0.3 mm | 7.5 (8) | | |

Chandipura virus also grows in Aedes albopictus, Aedes aegypti, Aedes W-albus, Anopheles stephensi and Toxorhynchites amboinensis cell lines without producing CPE (9,10).

* Expressed in dex

## 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 |
|---|---|---|---|
| Man (blood) | 2/58 | 155/203 NT | Maharashtra State, India (1) |
| Man | | 293/972 NT | Variouz other states, India (1) |
| Phlebotomus sp. | 1/2,070 (21 pools) | | Aurangabad, Maharash tra State, India |
| Camels | | 1/50 NT | India (1) |
| Horses | | 13/71 NT | |
| Donkeys | | 13/40 NT | |
| Cows | | 11/18 NT | |
| Buffalo | | 2/8 NT | |
| Sheep | | 4/14 NT | |
| Goats | | 6/19 NT | |
| Rhesus monkeys | | 7/43 NT | |
| Atelerix spiculus (hedgehog) | 1 | | Kware, Nigeria (7) |
| Atelerix albiventris | 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) | Prototype (1) | ic 0.02 | Death | 1-3 | >10 |
| Mice (nb) | | ip 0.02 | Death | 1-3 | >10 |
| Mice (nb) | | sc | Death | 1-3 | |
| Mice (wn) | | ic 0.03 | Death | 1-6 | 10 |
| Mice (wn) | | ip 0.03 | Antibody and survival | | |

NOTE: Newborn mice develop high level of viremia after inoculation; adult mice have low-titered or no detectable viremia during infection (1).

## 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 |

Experimental transmission of Chandipura virus to mice demonstrated with orally infected Aedes albopictus, Aedes aegypti, Anopheles stephensi and Culex quinquefasciatus (10).

Experimental transmission by Phlebotomus papatasi also demonstrated (14).

Chandipura virus induces CO2 sensitivity in Culex quinquefasciatus, Toxorhynchites amboinensis and Drosophila melanogaster following inoculation (11,12).

## Section X - Histopathology

Character of lesions (specify host)
**See Reference 13 for discussion of pathology.**

Inclusion Bodies — Intranuclear

Organs/Tissues Affected

Category of tropism
**Epitheliotropic, neurotropic, viscerotropic (13)**

## Section XI - Human Disease

In Nature — Residual — Death
**Reported**

Subclinical — Overt Disease

Clinical Manifestations
**Chills, fever, myalgia, arthralgia, vomiting and weakness (1)**

Number of Cases
**Two recognized**

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

## Section XII - Geographic Distribution

Known (Virus detected)
**India, Nigeria**

Suspected (Antibody only detected)

## Section XIII - References


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## Remarks