

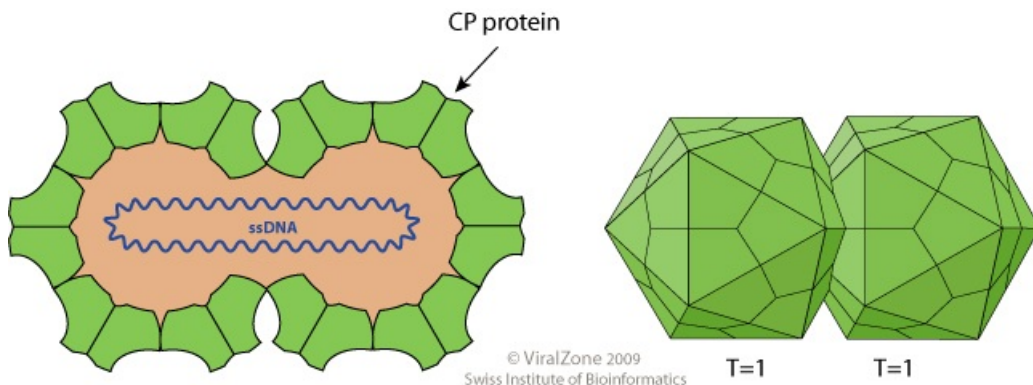


- General
- Proteins by Strain
- Proteins by Name
- Host-virus interaction

 search virus

## Geminiviridae

### VIRION



Non-enveloped, about 38 nm in length and 22 nm in diameter (for MSV), twinned (geminate) incomplete **T=1 icosahedral symmetry** capsid that contains 22 pentameric capsomeres made of 110 capsid proteins (CP). Each geminate particle contains only a single circular ssDNA.

### GENOME

Mono-, or bipartite, circular, **ssDNA genome** (+) of about 2.5-3.0 (monopartite) or 4.8-5.6 kb (bipartite). The number of genome segments depends on the genera. 3' terminus has no poly(A) tract. There are coding regions in both the virion (positive) and complementary (negative) sense strands.

The genome is replicated through double-stranded intermediates. The replication (Rep) protein initiates and terminates **rolling circle replication**, the host DNA polymerase being used for DNA replication itself. There is a potential stem-loop structure in the intergenic region that includes a conserved nona-nucleotide sequence (TAATATTAC) where ssDNA synthesis is initiated.

### GENE EXPRESSION

Transcription is bidirectional (c-sense and v-sense). Most of the time, proteins encoded on the c-sense are involved in DNA replication, in regulation of transcription and in interfering with cellular processes, whereas proteins encoded on the v-sense have movement and structural functions.

### REPLICATION

### NUCLEAR

1. Virus penetrates into the host cell.
2. Uncoating, the viral ssDNA genome **penetrates into the nucleus**.
3. The ssDNA is converted into dsDNA with the participation of cellular factors.
4. bidirectional **dsDNA transcription** from the IR promoter produces viral mRNAs and translation of viral proteins.
5. Replication is initiated by cleavage of the(+)strand by REP, and occurs by **rolling circle** producing ssDNA genomes.
6. These newly synthesized ssDNA can either
  - a) be converted to dsDNA and serve as a template for transcription/replication
  - b) be encapsidated by capsid protein and form virions released by **cell lysis**.
  - c) be transported outside the nucleus, to a neighboring cell through plasmodesmata (cell-cell movement) with the help of **viral movement proteins**.

### DB LINKS

Nucleotide DB: [NCBI](#)

Protein DB: UniProtKB ★★

Virus DB: [DPV](#)

### TAXONOMY

Group II: **ssDNA viruses**

Family: **Geminiviridae**

Genus: *Mastrevirus*  
*Curtovirus*  
*Begomovirus*  
*Topocuvirus*  
*Eragrovirus*  
*Turncurtovirus*  
*Becurtovirus*

## SPECIES

Type: Maize streak virus (**MSV**)  
Beet curly top virus (**BCTV**)  
Tomato pseudo-curly top virus (**TPCTV**)  
Bean golden yellow mosaic virus (**BGYMV**)

## REFERENCE STRAINS

Bean golden yellow mosaic virus  
Sequence: [Segment A Segment B](#) | [Genome](#) | [Proteome](#)  
Beet curly top virus California [Logan]  
[Sequence](#) | [Genome](#) | [Proteome](#)  
Maize streak virus A South Africa  
[Sequence](#) | [Genome](#) | [Proteome](#)  
Tomato pseudo-curly top virus  
[Sequence](#) | [Genome](#) | [Proteome](#)

## Host

### NATURAL HOSTS

Plants

### TROPISM

-

### INTERACTIONS

Cell receptors: -  
[Host-virus interaction](#)

## Epidemiology

### GEOGRAPHY

Worldwide

### ASSOCIATED DISEASES

Variable depending on the virus specie. May include bright yellow mosaic, yellow mosaic, yellow mottle, leaf curling, stunting, streaks, reduced yields.

### TRANSMISSION

Vector=insects.

### ANTIVIRAL DRUGS

## Host-virus interaction

### Cell-cycle modulation

Begomovirus protein Rep and mastrevirus protein RepA are responsible for inhibiting host retinoblastoma protein and inducing [transition from the G1 to S phase](#) in preparation for virus replication since the virus targets differentiated non-dividing cells. 📄.

### Suppression of host silencing-mediated antiviral defense

Geminiviruses viral proteins are able to [suppress host cell RNA silencing](#)

Begomovirus: 📄 📄 📄 📄 Curtovirus: 📄

## GENERAL

[Back to geminiviridae page](#)

### NATURAL HOSTS

Plants

### TROPISM

-

### INTERACTIONS

Cell receptors: -

### ASSOCIATED DISEASES

Variable depending on the virus specie. May include bright yellow mosaic, yellow mosaic, yellow mottle, leaf curling, stunting, streaks, reduced yields.

#### TRANSMISSION

Vector=insects.

#### Matching UniProtKB/Swiss-Prot entries

198 entries grouped by **strain** ([browse by keywords](#))

[reorder by proteins](#)

All proteins are shown ([view only 187 complete proteome entries](#))

#### Bean golden yellow mosaic virus (isolate Puerto Rico-Japan) (BGYMV) reference strain

7 entries

- [AC4\\_BGYMJ](#)Protein AC4 (Protein AL4)
- [CAPSD\\_BGYMJ](#)Capsid protein (Coat protein) (CP)
- [MVP\\_BGYMJ](#)Movement protein BC1 (Movement protein BL1)
- [NSP\\_BGYMJ](#)Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_BGYMJ](#)Replication enhancer protein (REn) (15.6 kDa protein) (Protein AC3) (Protein ...)
- [REP\\_BGYMJ](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.2 kDa ...)
- [TRAP\\_BGYMJ](#)Transcriptional activator protein (TrAP) (19.6 kDa protein) (Protein AC2) ...

#### Beet curly top virus (strain California/Logan) (BCTV) reference strain

7 entries

- [AC4\\_BCTVC](#)Protein C4 (Protein L4)
- [C2\\_BCTVC](#)Protein C2 (Protein L2)
- [CAPSD\\_BCTVC](#)Capsid protein (Coat protein) (CP)
- [MP\\_BCTVC](#)Movement protein (MP)
- [REN\\_BCTVC](#)Replication enhancer (REn) (16.1 kDa protein) (Protein C3) (Protein L3)
- [REP\\_BCTVC](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.8 kDa ...)
- [V2\\_BCTVC](#)Protein V2 (12.1 kDa protein)

#### Tomato pseudo-curly top virus (TPCTV) reference strain

6 entries

- [AC4\\_TPCTV](#)Protein C4 (Protein L4)
- [C2\\_TPCTV](#)Protein C2 (Protein L2)
- [CAPSD\\_TPCTV](#)Capsid protein (Coat protein) (CP)
- [MP\\_TPCTV](#)Putative movement protein (MP)
- [REN\\_TPCTV](#)Replication enhancer protein (REn) (16.1 kDa protein) (Protein C3) (Protein L3)
- [REP\\_TPCTV](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)

#### Tomato yellow leaf curl virus (strain Israel) (TYLCV) reference strain


6 entries

- [AC4\\_TYLCI](#)Protein C4 (10.9 kDa protein) (Protein L4)
- [AV2\\_TYLCI](#)Protein V2
- [CAPSD\\_TYLCI](#)Capsid protein (Coat protein) (CP)
- [REN\\_TYLCI](#)Replication enhancer protein (REn) (15.6 kDa protein) (Protein C3) (Protein L3)
- [REP\\_TYLCI](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)
- [TRAP\\_TYLCI](#)Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

#### Maize streak virus genotype A (isolate South Africa) (MSV) reference strain

4 entries

- [CAPSD\\_MSVS](#)Capsid protein (Coat protein) (CP)
- [MP\\_MSVS](#)Movement protein (MP)
- [REPA\\_MSVS](#)Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MSVS](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Indian cassava mosaic virus (ICMV)**

9 entries

[AC4\\_ICMV](#) Protein AC4 (Protein AL4)

[AV2\\_ICMV](#) Protein AV2

[CAPSD\\_ICMV](#) Capsid protein (Coat protein) (CP)

[MVP\\_ICMV](#) Movement protein BC1 (Movement protein BL1)

[NSP\\_ICMV](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)

[REN\\_ICMV](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)

[REP\\_ICMV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...

[TRAP\\_ICMV](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

[YAL4\\_ICMV](#) Putative uncharacterized protein AC5

**African cassava mosaic virus (isolate Nigerian) (ACMV) (Cassava latent virus (isolate Nigerian))**

8 entries

[AC4\\_CLVN](#) Protein AC4 (Protein AL4)

[AV2\\_CLVN](#) Uncharacterized 13.1 kDa protein

[CAPSD\\_CLVN](#) Capsid protein (Coat protein) (CP)

[MVP\\_CLVN](#) Movement protein BC1 (33.7 kDa protein) (Movement protein BL1)

[NSP\\_CLVN](#) Nuclear shuttle protein (NSP) (29.4 kDa protein) (Protein BR1) (Protein BV1)

[REN\\_CLVN](#) Replication enhancer protein (REn) (15.9 kDa protein) (Protein AC3) (Protein ...

[REP\\_CLVN](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.4 kDa ...

[TRAP\\_CLVN](#) Transcriptional activator protein (TrAP) (15.2 kDa protein) (Protein AC2) ...

**African cassava mosaic virus (isolate West Kenyan 844) (ACMV) (Cassava latent virus (isolate West Kenyan 844))**

8 entries

[AC4\\_CLVK](#) Protein AC4 (Protein AL4)

[AV2\\_CLVK](#) Protein AV2

[CAPSD\\_CLVK](#) Capsid protein (Coat protein) (CP)

[MVP\\_CLVK](#) Movement protein BC1 (33.7 kDa protein) (Movement protein BL1)

[NSP\\_CLVK](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)

[REN\\_CLVK](#) Replication enhancer protein (REn) (15.9 kDa protein) (Protein AC3) (Protein ...

[REP\\_CLVK](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.4 kDa ...

[TRAP\\_CLVK](#) Transcriptional activator protein (TrAP) (15.2 kDa protein) (Protein AC2) ...

**Mungbean yellow mosaic virus (strain Vigna) (MYMV)**

8 entries

[AC4\\_MYMVV](#) Protein AC4 (Protein AL4)

[AV2\\_MYMVV](#) Protein AV2

[CAPSD\\_MYMVV](#) Capsid protein (Coat protein) (CP)

[MVP\\_MYMVV](#) Movement protein BC1 (Movement protein BL1)

[NSP\\_MYMVV](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)

[REN\\_MYMVV](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)

[REP\\_MYMVV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...

[TRAP\\_MYMVV](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Abutilon mosaic virus (isolate West India) (AbMV)**

7 entries

[AC4\\_ABMVW](#) Protein AC4 (Protein AL4)

[CAPSD\\_ABMVW](#) Capsid protein (Coat protein) (CP)

[MVP\\_ABMVW](#) Movement protein BC1 (Movement protein BL1)

[NSP\\_ABMVW](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)

- [REN\\_ABMVW](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_ABMVW](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_ABMVW](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Bean golden yellow mosaic virus (isolate Puerto Rico) (BGYMV) (Bean golden mosaic virus (isolate Puerto Rico))**

7 entries

- [AC4\\_BGYMV](#) Protein AC4 (Protein AL4)
- [CAPSD\\_BGYMV](#) Capsid protein (Coat protein) (CP)
- [MVP\\_BGYMV](#) Movement protein BC1 (Movement protein BL1)
- [NSP\\_BGYMV](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_BGYMV](#) Replication enhancer protein (REn) (15.6 kDa protein) (Protein AC3) (Protein ...
- [REP\\_BGYMV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.2 kDa ...
- [TRAP\\_BGYMV](#) Transcriptional activator protein (TrAP) (19.6 kDa protein) (Protein AC2) ...

**Cabbage leaf curl virus (isolate Jamaica) (CaLCuV)**

7 entries

- [AC4\\_CALCVC](#) Protein AC4 (Protein AL4)
- [CAPSD\\_CALCVC](#) Capsid protein (Coat protein) (CP)
- [MVP\\_CALCVC](#) Movement protein BC1 (Movement protein BL1)
- [NSP\\_CALCVC](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_CALCVC](#) Replication enhancer protein (REn) (15.6 kDa protein) (Protein AC3) (Protein ...
- [REP\\_CALCVC](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (40.2 kDa ...
- [TRAP\\_CALCVC](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Potato yellow mosaic virus (isolate Venezuela) (PYMV)**

7 entries

- [AC4\\_PYMVV](#) Protein AC4 (Protein AL4)
- [CAPSD\\_PYMVV](#) Capsid protein (Coat protein) (CP)
- [MVP\\_PYMVV](#) Movement protein BC1 (Movement protein BL1)
- [NSP\\_PYMVV](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_PYMVV](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_PYMVV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_PYMVV](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Squash leaf curl virus (SLCV)**

7 entries

- [AC4\\_SLCV](#) Protein AC4 (Protein AL4)
- [CAPSD\\_SLCV](#) Capsid protein (Coat protein) (CP)
- [MVP\\_SLCV](#) Movement protein BC1 (Movement protein BL1)
- [NSP\\_SLCV](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_SLCV](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_SLCV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_SLCV](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Tomato golden mosaic virus (strain Yellow vein) (TGMV)**

7 entries

- [AC4\\_TGMVY](#) Protein AC4 (Protein AL4)
- [BC1\\_TGMVY](#) Movement protein BC1 (Movement protein BL1)
- [CAPSD\\_TGMVY](#) Capsid protein (Coat protein) (CP)
- [NSP\\_TGMVY](#) Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_TGMVY](#) Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_TGMVY](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_TGMVY](#) Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Pepper huasteco yellow vein virus (PHYVV) (Pepper huasteco virus)**

6 entries



- [AC4\\_PHUV](#)Protein AC4 (Protein AL4)
- [CAPSD\\_PHUV](#)Capsid protein (Coat protein) (CP)
- [NSP\\_PHUV](#)Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_PHUV](#)Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_PHUV](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_PHUV](#)Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Tomato leaf curl virus (strain Australia) (ToLCV)**

6 entries



- [AC4\\_TLCVA](#)Protein C4 (10.9 kDa protein) (Protein L4)
- [AV2\\_TLCVA](#)Protein V2
- [CAPSD\\_TLCVA](#)Capsid protein (Coat protein) (CP)
- [REN\\_TLCVA](#)Replication enhancer protein (REn) (Protein C3) (Protein L3)
- [REP\\_TLCVA](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)
- [TRAP\\_TLCVA](#)Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

**Tomato mottle virus (isolate Florida) (ToMoV)**

6 entries



- [BC1\\_TMOV](#)Movement protein BC1 (Movement protein BL1)
- [CAPSD\\_TMOV](#)Capsid protein (Coat protein) (CP)
- [NSP\\_TMOV](#)Nuclear shuttle protein (NSP) (Protein BR1) (Protein BV1)
- [REN\\_TMOV](#)Replication enhancer protein (REn) (Protein AC3) (Protein AL3)
- [REP\\_TMOV](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein AC1) ...
- [TRAP\\_TMOV](#)Transcriptional activator protein (TrAP) (Protein AC2) (Protein AL2)

**Tomato yellow leaf curl China virus (TYLCCNV)**

6 entries



- [AC4\\_TYLCC](#)Protein C4 (10.9 kDa protein) (Protein L4)
- [AV2\\_TYLCC](#)Protein V2
- [CAPSD\\_TYLCC](#)Capsid protein (Coat protein) (CP)
- [REN\\_TYLCC](#)Replication enhancer protein (REn) (Protein C3) (Protein L3)
- [REP\\_TYLCC](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)
- [TRAP\\_TYLCC](#)Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

**Tomato yellow leaf curl Sardinia virus (TYLCSV)**

6 entries



- [AC4\\_TYCSV](#)Protein C4 (11.1 kDa protein) (Protein L4)
- [AV2\\_TYCSV](#)Protein V2
- [CAPSD\\_TYCSV](#)Capsid protein (Coat protein) (CP)
- [REN\\_TYCSV](#)Replication enhancer protein (REn) (Protein C3) (Protein L3)
- [REP\\_TYCSV](#)Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)

## \* 1L2M 1L5I

- [TRAP\\_TYCSV](#)Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

**Tomato yellow leaf curl Sardinia virus (isolate Spain-1) (TYLCSV)**

6 entries



- [AC4\\_TYCS1](#)Protein C4 (10.9 kDa protein) (Protein L4)
- [AV2\\_TYCS1](#)Protein V2
- [CAPSD\\_TYCS1](#)Capsid protein (Coat protein) (CP)
- [REN\\_TYCS1](#)Replication enhancer protein (REn) (Protein C3) (Protein L3)

[REP\\_TYCS1](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)

[TRAP\\_TYCS1](#) Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

**Tomato yellow leaf curl Sardinia virus (isolate Spain-2) (TYLCSV)**

6 entries

[AC4\\_TYCS2](#) Protein C4 (10.9 kDa protein) (Protein L4)

[AV2\\_TYCS2](#) Protein V2

[CAPSD\\_TYCS2](#) Capsid protein (Coat protein) (CP)

[REN\\_TYCS2](#) Replication enhancer protein (REn) (Protein C3) (Protein L3)

[REP\\_TYCS2](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-) (Protein C1)

[TRAP\\_TYCS2](#) Transcriptional activator protein (TrAP) (Protein C2) (Protein L2)

**Bean yellow dwarf virus (BeYDV)**

4 entries

[CAPSD\\_BEYDV](#) Capsid protein (Coat protein) (CP)

[MP\\_BEYDV](#) Movement protein (MP)

[REPA\\_BEYDV](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_BEYDV](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype A (isolate Kenya) (MSV)**

4 entries

[CAPSD\\_MSVK](#) Capsid protein (Coat protein) (CP)

[MP\\_MSVK](#) Movement protein (MP)

[REPA\\_MSVK](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MSVK](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype A (isolate Nigeria) (MSV)**

4 entries

[CAPSD\\_MS VN](#) Capsid protein (Coat protein) (CP)

[MP\\_MS VN](#) Movement protein (MP)

[REPA\\_MS VN](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MS VN](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype B (isolate Tas) (MSV)**

4 entries

[CAPSD\\_MS VTA](#) Capsid protein (Coat protein) (CP)

[MP\\_MS VTA](#) Movement protein (MP)

[REPA\\_MS VTA](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MS VTA](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype C (isolate Set) (MSV)**

4 entries

[CAPSD\\_MS VSE](#) Capsid protein (Coat protein) (CP)

[MP\\_MS VSE](#) Movement protein (MP)

[REPA\\_MS VSE](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MS VSE](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype D (isolate Raw) (MSV)**

4 entries

[CAPSD\\_MS VRA](#) Capsid protein (Coat protein) (CP)

[MP\\_MS VRA](#) Movement protein (MP)

[REPA\\_MS VRA](#) Replication-associated protein A (RepA) (EC 3.1.21.-)

[REP\\_MS VRA](#) Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Maize streak virus genotype E (isolate Pat) (MSV)**

4 entries



- CAPSD\_MSVPA Capsid protein (Coat protein) (CP)
- MP\_MSVPA Movement protein (MP)
- REPA\_MSVPA Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_MSVPA Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Miscanthus streak virus (isolate 91) (MiSV)**

4 entries



- CAPSD\_MISV9 Capsid protein (Coat protein) (CP)
- MP\_MISV9 Putative movement protein (MP)
- REPA\_MISV9 Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_MISV9 Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Panicum streak virus (isolate Kenya) (PanSV)**

4 entries



- CAPSD\_PASVK Capsid protein (Coat protein) (CP)
- MP\_PASVK Movement protein (MP)
- REPA\_PASVK Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_PASVK Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Sugarcane streak virus (isolate South Africa) (SSV) (Sugarcane streak virus (isolate Natal))**

4 entries



- CAPSD\_SSVN Capsid protein (Coat protein) (CP)
- MP\_SSVN Movement protein (MP)
- REPA\_SSVN Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_SSVN Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Tobacco yellow dwarf virus (strain Australia) (TYDV)**

4 entries



- CAPSD\_TYDVA Capsid protein (Coat protein) (CP)
- MP\_TYDVA Movement protein (MP)
- REPA\_TYDVA Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_TYDVA Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Wheat dwarf virus (isolate Sweden) (WDV)**

4 entries



- CAPSD\_WDVS Capsid protein (Coat protein) (CP)
- MP\_WDVS Movement protein (MP)
- REPA\_WDVS Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_WDVS Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)

**Chloris striate mosaic virus (CSMV)**

3 entries



- CAPSD\_CSMV Capsid protein (Coat protein) (CP)
- REPA\_CSMV Replication-associated protein A (RepA) (EC 3.1.21.-)
- REP\_CSMV Replication-associated protein (Rep) (EC 2.7.7.-) (EC 3.1.21.-)