

Virus	ID	Genus	aa position	eee	hh	hhhh	hh	ee
TSWV	AEK06236	<i>Tospovirus</i>	111	---ANKV <b>I</b> KI---	CPTWD---			-----SRKQ <b>Y</b> M-----
RCNMV	NP_620546	<i>Dianthovirus</i>	33	---GVSEAPL---	IPAS <b>M</b> SKITDY---	AKTTAK---		-----GNSVAL-----
SBWMV	NP_049337	<i>Furovirus</i>	44	---RYVEKAL---	TQPGV <b>V</b> TKMQDA---	WTNWTKTN---		-----KEEGTPY <b>N</b> M-----
CMoV	YP_002302261	<i>Umbravirus</i>	42	---TL <b>T</b> HTPL---	YPRR <b>Q</b> LTL <b>S</b> RF---	FSGRWR---		-----TKKTGG <b>M</b> L-----
CNSV	NP_733974	<i>Nepovirus B</i>	432	---V <b>L</b> NR---	PE <b>Y</b> N---AL <b>N</b> KL---	AEAGW---		-----KEA-----
OuMV	YP_002019758	<i>Ourmiavirus</i>	57	---VED <b>P</b> I <b>A</b> L---	IP <b>H</b> GI <b>W</b> SIF <b>K</b> SK---	LAQMR---		-----CPKG <b>Y</b> I-----
PoLV	YP_009032637	<i>Aureovirus</i>	30	---TK <b>A</b> L <b>L</b> P <b>L</b> ---	APIS <b>Q</b> FS <b>K</b> W <b>K</b> IP---			-----KQGF <b>Y</b> -----
CPsV	YP_089663	<i>Ophiovirus</i>	84	---H <b>K</b> KL <b>L</b> K <b>L</b> ---	G <b>T</b> L <b>K</b> ---S <b>I</b> T <b>D</b> K---	L <b>R</b> KL <b>G</b> G---		-----ESS <b>Q</b> P <b>F</b> I-----
CPMV	NP_734000	<i>Comovirus</i>	204	---T <b>V</b> L <b>D</b> L <b>P</b> V---	TK <b>D</b> K---T <b>L</b> AMA---	S <b>D</b> F <b>I</b> R <b>K</b> ---		-----ENL <b>K</b> T <b>S</b> A <b>I</b> -----
CiLV-C	YP_654542	<i>Cilevirus</i>	47	---R <b>I</b> GV <b>G</b> F <b>L</b> ---	T <b>P</b> N <b>D</b> ---M <b>I</b> S <b>R</b> L---	V <b>G</b> F <b>I</b> N <b>R</b> KA <b>E</b> D <b>A</b> G <b>V</b> R <b>S</b> V <b>E</b> S <b>F</b> R---		-----
CRLV	YP_081449	<i>Cheravirus</i>	109	---D <b>P</b> Y <b>V</b> A <b>V</b> Y <b>T</b> PL <b>P</b> H <b>I</b> T <b>E</b> E---	Q <b>A</b> R <b>K</b> L---	M-----		-----E <b>K</b> G <b>F</b> S <b>N</b> S-----
GFLV	NP_733995	<i>Nepovirus A</i>	118	---N <b>T</b> L <b>E</b> I <b>L</b> Y <b>N</b> ---	P <b>V</b> S <b>E</b> E---E <b>M</b> E <b>E</b> Y---	R-----		-----D <b>R</b> G <b>M</b> S <b>A</b> V-----
RSV	NP_620519	<i>Tenuivirus</i>	88	---A <b>T</b> F <b>N</b> I---	L <b>V</b> D <b>P</b> ---Y <b>W</b> F <b>H</b> Q---	PL-----		-----T <b>H</b> Y <b>P</b> F <b>R</b> V <b>T</b> H <b>Y</b> P <b>F</b> F <b>R</b> V-----
ACLSV	NP_040552	<i>Tricovirus</i>	62	---R <b>L</b> A <b>S</b> I <b>P</b> V---	I <b>P</b> S <b>S</b> ---E <b>V</b> Q <b>A</b> V---	L <b>R</b> K---		-----R <b>E</b> S <b>T</b> N <b>Y</b> V-----
SDV	NP_733976	<i>Sadwavirus</i>	53	---Q <b>Q</b> Q <b>D</b> I <b>A</b> I---	P <b>L</b> S <b>S</b> ---R <b>F</b> ---			-----G <b>N</b> H <b>Q</b> S <b>L</b> -----
PYMoV	YP_008567619	<i>Badnavirus</i>	100	---N <b>Q</b> V <b>D</b> R <b>T</b> F---	I <b>Q</b> E <b>E</b> ---S <b>H</b> K <b>K</b> L---	V <b>K</b> ---		-----S <b>G</b> I <b>K</b> F <b>I</b> -----
RRV	YP_004327592	<i>Emaravirus</i>	63	---K <b>T</b> Q <b>L</b> L <b>P</b> I---	S <b>V</b> Y <b>N</b> ---E <b>M</b> Y <b>K</b> F---	Y <b>M</b> H <b>L</b> ---		-----K <b>Q</b> P <b>M</b> T-----
TMV	NP_597748	<i>Tobamovirus</i>	36	-CS <b>K</b> V <b>D</b> K <b>I</b> M <b>V</b> ---	H <b>E</b> N <b>E</b> ---S <b>L</b> S <b>E</b> V <b>N</b> ---	L <b>L</b> K <b>G</b> V <b>K</b> ---		-----L <b>I</b> D <b>S</b> G <b>Y</b> C-----
CLBV	NP_624334	<i>Citriovirus</i>	55	---I <b>K</b> L <b>Q</b> A <b>N</b> I---	L <b>T</b> A <b>D</b> ---R <b>L</b> Q <b>S</b> I---	R <b>N</b> A <b>K</b> V <b>N</b> ---		-----G <b>K</b> E <b>A</b> A <b>Y</b> L-----
PYFV	NP_734443	<i>Sequivirus</i>	115	---R <b>A</b> E <b>I</b> T <b>P</b> ---	T <b>A</b> A <b>S</b> ---K <b>L</b> D <b>K</b> T---	L <b>E</b> A <b>H</b> ---		-----R <b>A</b> K <b>F</b> N <b>Y</b> M-----
RBDV	NP_620466	<i>Idaeovirus</i>	138	---G <b>K</b> N <b>E</b> F <b>S</b> L---	V <b>E</b> A <b>S</b> ---V <b>F</b> D <b>K</b> L---	I <b>R</b> K-----		-----D <b>D</b> S <b>P</b> I-----
<b>CCGaV</b>			123	D <b>D</b> T <b>E</b> Q <b>F</b> N <b>L</b> S <b>L</b> ---	A <b>V</b> ---	P <b>K</b> K-----		-----G <b>K</b> Q <b>V</b> Y-----
TBSV	NP_062900	<i>Tombusvirus</i>	32	---E <b>D</b> Q <b>E</b> V <b>P</b> L---	L <b>P</b> S <b>N</b> F <b>L</b> T <b>K</b> V <b>R</b> V <b>G</b> ---			-----L <b>S</b> G <b>G</b> Y <b>I</b> -----
ToTV	YP_001040018	<i>Torradovirus</i>	66	---K <b>K</b> A <b>M</b> E <b>L</b> ---	F <b>D</b> P <b>E</b> D <b>V</b> H <b>N</b> I <b>T</b> S <b>L</b> W <b>S</b> S <b>F</b> K <b>K</b> T <b>F</b> T <b>S</b> ---			-----S <b>R</b> D <b>H</b> G <b>N</b> L <b>F</b> F-----
CaMV	NP_056724	<i>Caulimovirus</i>	97	---G <b>K</b> V <b>Y</b> L <b>P</b> L---	I <b>T</b> K <b>E</b> E <b>I</b> N <b>K</b> R <b>L</b> S <b>S</b> ---	L <b>K</b> P <b>E</b> V---		-----R <b>K</b> T <b>M</b> S <b>M</b> V-----
CMV	NP_040776	<i>Cucumovirus</i>	52	---A <b>I</b> S <b>V</b> R <b>L</b> P---	V <b>P</b> E <b>V</b> T <b>H</b> G <b>R</b> I <b>A</b> S <b>F</b> ---	F <b>K</b> S <b>G</b> Y <b>D</b> V---		-----G <b>E</b> L <b>C</b> S <b>K</b> G <b>Y</b> M-----
AMV	NP_041194	<i>Alfamovirus</i>	60	---A <b>P</b> V <b>V</b> L <b>S</b> L---	V <b>S</b> K <b>E</b> K <b>S</b> I <b>L</b> N <b>R</b> M---	L <b>P</b> K <b>I</b> G---		-----Q <b>R</b> M <b>Y</b> V-----
LNyV	YP_425089	<i>Cytorhabdovirus</i>	53	---I <b>M</b> R <b>Q</b> V <b>P</b> L---	F <b>D</b> K <b>E</b> ---D <b>L</b> D <b>A</b> M---	K <b>S</b> D <b>T</b> ---		-----T <b>S</b> N <b>K</b> Y <b>L</b> -----
AcVb	YP_004935360	<i>Vitivirus</i>	78	---V <b>D</b> Q <b>N</b> I <b>D</b> L---	V <b>D</b> E <b>K</b> ---T <b>I</b> D <b>G</b> L---	N <b>E</b> E-----		-----K <b>Q</b> P <b>Y</b> L-----
CaLCuV	NP_624353	<i>Begomovirus</i>	38	---L <b>T</b> E <b>I</b> L <b>L</b> ---	Q <b>F</b> P <b>S</b> ---T <b>A</b> A <b>Q</b> F---	T <b>A</b> R <b>L</b> ---		-----N <b>R</b> S <b>C</b> M-----

  

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TSWV	AEK06236	<i>Tospovirus</i>	-M <b>S</b> R <b>I</b> V <b>I</b> W <b>V</b> C <b>P</b> T <b>I</b> P <b>N</b> -----	PT <b>G</b> K <b>L</b> V <b>V</b> A <b>L</b> V <b>D</b> P <b>N</b> M <b>P</b> S <b>E</b> -----	K <b>Q</b> V <b>I</b> L--K <b>G</b> Q <b>G</b> T <b>I</b> T
RCNMV	NP_620546	<i>Dianthovirus</i>	-N <b>Y</b> T <b>H</b> V <b>L</b> S <b>L</b> A <b>P</b> T <b>I</b> G <b>V</b> -----	A <b>I</b> P <b>G</b> H <b>V</b> T <b>V</b> E <b>L</b> I <b>N</b> P <b>N</b> V <b>E</b> G <b>P</b> -----	F <b>Q</b> V <b>M</b> S <b>G</b> Q <b>T</b> L <b>S</b> W <b>S</b> P <b>G</b>
SBWMV	NP_049337	<i>Furovirus</i>	-S <b>Y</b> S <b>C</b> V <b>L</b> L <b>N</b> V <b>I</b> P <b>T</b> V <b>P</b> M-----	G <b>Y</b> A <b>G</b> T <b>V</b> E <b>V</b> S <b>L</b> L <b>D</b> S <b>G</b> L <b>S</b> P <b>L</b> -----	E <b>N</b> V <b>I</b> P <b>D</b> Q <b>T</b> Q <b>M</b> E <b>I</b> G
CMoV	YP_002302261	<i>Umbravirus</i>	-F <b>I</b> E <b>K</b> L <b>V</b> I <b>V</b> F <b>V</b> P <b>H</b> V <b>P</b> D-----	T <b>S</b> P <b>G</b> Q <b>A</b> V <b>I</b> W <b>V</b> H <b>D</b> T <b>A</b> L <b>P</b> G <b>L</b> -----	E <b>P</b> I <b>G</b> T <b>G</b> Q <b>R</b> V <b>C</b> I <b>P</b> L <b>S</b>
CNSV	NP_733974	<i>Nepovirus B</i>	-K <b>S</b> V <b>V</b> L <b>N</b> L <b>H</b> I <b>R</b> S <b>Y</b> L <b>P</b> Q-----	Q <b>M</b> N <b>A</b> Y <b>A</b> F <b>C</b> V <b>I</b> M <b>W</b> G <b>H</b> S <b>S</b> D <b>A</b> -----	Q <b>E</b> A <b>L</b> -S <b>G</b> S <b>V</b> Y <b>V</b> I <b>G</b>
OuMV	YP_002019758	<i>Ourmiavirus</i>	-T <b>Y</b> D <b>K</b> V <b>L</b> S <b>W</b> K <b>P</b> H <b>V</b> A <b>T</b> -----	G <b>L</b> A <b>R</b> Q <b>I</b> A <b>V</b> V <b>D</b> T <b>R</b> V <b>N</b> H <b>T</b> S <b>I</b> E <b>D</b> L <b>M</b> H <b>K</b> A <b>L</b> W-K <b>T</b> A <b>P</b> V <b>D</b> L <b>G</b>	
PoLV	YP_009032637	<i>Aureovirus</i>	-A <b>P</b> I <b>D</b> V <b>K</b> F <b>V</b> L <b>T</b> P <b>H</b> I <b>S</b> E-----	R <b>A</b> Q <b>V</b> R <b>G</b> V <b>V</b> K <b>L</b> V <b>D</b> S <b>R</b> D <b>L</b> S <b>P</b> -----	S <b>R</b> E <b>L</b> Y-R <b>S</b> K <b>E</b> F <b>N</b> I <b>G</b>
CPsV	YP_089663	<i>Ophiovirus</i>	-Q <b>F</b> Y <b>K</b> V <b>Q</b> C <b>M</b> Y <b>I</b> P <b>L</b> F <b>S</b> R <b>V</b> ---	D <b>G</b> D <b>N</b> G <b>E</b> I <b>T</b> V <b>S</b> L <b>I</b> D <b>D</b> G <b>K</b> E <b>A</b> A-----	G <b>Q</b> D <b>P</b> I <b>I</b> -Q <b>S</b> I <b>T</b> F <b>D</b> A <b>S</b>
CPMV	NP_734000	<i>Comovirus</i>	-H <b>I</b> G <b>A</b> I <b>E</b> I <b>I</b> Q <b>S</b> F <b>A</b> S <b>P</b> ---	E <b>S</b> D <b>L</b> M <b>G</b> G <b>F</b> L <b>L</b> V <b>D</b> S <b>L</b> H <b>T</b> D <b>T</b> -----	A <b>N</b> A <b>I</b> R-S <b>I</b> F <b>V</b> A <b>P</b> M <b>R</b>
CiLV-C	YP_654542	<i>Cilevirus</i>	-Q <b>I</b> S <b>D</b> V <b>L</b> I <b>V</b> P <b>Q</b> I <b>A</b> -----	L <b>P</b> A <b>E</b> L <b>S</b> L <b>K</b> L <b>V</b> D <b>S</b> A <b>N</b> I-----	L <b>E</b> A <b>V</b> N-Q <b>E</b> V <b>T</b> V <b>N</b> S <b>T</b>
CRLV	YP_081449	<i>Cheravirus</i>	-S <b>N</b> V <b>A</b> L <b>D</b> M <b>A</b> V <b>Q</b> S <b>H</b> V <b>G</b> Q-----	G <b>T</b> P <b>L</b> L <b>A</b> M <b>C</b> G <b>I</b> M <b>D</b> S <b>R</b> T <b>D</b> D <b>P</b> -----	N <b>E</b> A <b>L</b> Q-V <b>A</b> G <b>Y</b> F <b>D</b> L <b>G</b>
GFLV	NP_733995	<i>Nepovirus A</i>	-V <b>I</b> D <b>A</b> L <b>E</b> I <b>A</b> I <b>N</b> P <b>F</b> G <b>M</b> P-----	G <b>N</b> P <b>T</b> D <b>L</b> T <b>V</b> V <b>A</b> T <b>Y</b> G <b>H</b> E <b>R</b> D <b>M</b> -----	T <b>R</b> A <b>F</b> I-G <b>S</b> A <b>S</b> T <b>F</b> L <b>G</b>
RSV	NP_620519	<i>Tenuivirus</i>	E <b>T</b> F <b>A</b> M <b>V</b> W <b>I</b> G <b>I</b> K <b>G</b> -----	R <b>A</b> S <b>G</b> I <b>T</b> T <b>L</b> R <b>I</b> D <b>K</b> S <b>Y</b> V <b>N</b> P-----	S <b>D</b> Q <b>V</b> E-V <b>E</b> V <b>R</b> Y <b>P</b> I <b>S</b>
ACLSV	NP_040552	<i>Tricovirus</i>	-H <b>W</b> G <b>A</b> L <b>S</b> I <b>S</b> I <b>D</b> A <b>L</b> F <b>R</b> K-----	N <b>A</b> G <b>V</b> S <b>G</b> W <b>C</b> Y <b>V</b> Y <b>D</b> N <b>R</b> W <b>E</b> T <b>F</b> -----	E <b>Q</b> A <b>M</b> L-Q <b>K</b> F <b>H</b> F <b>N</b> L <b>D</b>
SDV	NP_733976	<i>Sadwavirus</i>	-H <b>V</b> G <b>E</b> L <b>E</b> I <b>A</b> V <b>Q</b> S <b>S</b> V <b>L</b> T-----	G <b>V</b> D <b>T</b> A <b>M</b> A <b>I</b> M <b>V</b> S <b>D</b> A <b>S</b> H <b>D</b> R <b>L</b> -----	E <b>E</b> G <b>F</b> L-S <b>L</b> T <b>I</b> L <b>R</b> L <b>G</b>
PYMoV	YP_008567619	<i>Badnavirus</i>	-H <b>L</b> G <b>V</b> L <b>Q</b> V <b>R</b> L <b>Q</b> L <b>H</b> R <b>K</b> -----	E <b>E</b> G <b>T</b> L <b>A</b> L <b>V</b> V <b>F</b> R <b>D</b> N <b>R</b> W <b>K</b> G-----	D <b>K</b> G <b>I</b> I-A <b>T</b> M <b>E</b> V <b>D</b> L <b>T</b>
RRV	YP_004327592	<i>Emaravirus</i>	-R <b>I</b> A <b>S</b> V <b>A</b> L <b>F</b> W <b>T</b> P <b>T</b> S <b>K</b> -----	R <b>F</b> N <b>E</b> M <b>A</b> T <b>L</b> I <b>L</b> M <b>D</b> E <b>R</b> F <b>R</b> D <b>D</b> G <b>I</b> -K <b>Q</b> G <b>K</b> K <b>E</b> L <b>L</b> -A <b>Q</b> G <b>K</b> L <b>N</b> L <b>D</b>	
TMV	NP_597748	<i>Tobamovirus</i>	--L <b>A</b> G <b>L</b> V <b>V</b> T <b>G</b> E <b>W</b> N <b>L</b> P <b>D</b> -----	N <b>C</b> R <b>G</b> G <b>V</b> S <b>V</b> C <b>L</b> V <b>D</b> K <b>R</b> M <b>E</b> R <b>A</b> -----	D <b>E</b> A <b>T</b> L-G <b>S</b> Y <b>T</b> A <b>A</b> A
CLBV	NP_624334	<i>Citriovirus</i>	-H <b>L</b> G <b>F</b> V <b>P</b> I <b>A</b> I <b>R</b> S <b>L</b> L <b>P</b> S-----	G <b>N</b> E <b>Q</b> I <b>W</b> G <b>R</b> C <b>A</b> L <b>V</b> D <b>T</b> S <b>R</b> T <b>R</b> A-----	E <b>T</b> A <b>V</b> I-D <b>E</b> F <b>E</b> F <b>K</b> F <b>T</b>
PYFV	NP_734443	<i>Sequivirus</i>	-A <b>I</b> D <b>S</b> I <b>R</b> V <b>A</b> V <b>T</b> S <b>L</b> M <b>H</b> Q-----	G <b>D</b> S <b>R</b> E <b>C</b> I <b>M</b> Y <b>L</b> C <b>D</b> R <b>R</b> F <b>K</b> D <b>P</b> -----	L <b>L</b> G <b>A</b> I-A <b>L</b> I <b>G</b> F <b>T</b> L <b>P</b>
RBDV	NP_620466	<i>Idaeovirus</i>	-H <b>L</b> N <b>R</b> L <b>L</b> I <b>A</b> V <b>L</b> P <b>A</b> V <b>G</b> K-----	G <b>T</b> P <b>G</b> T <b>A</b> R <b>I</b> K <b>I</b> R <b>D</b> A <b>R</b> L <b>D</b> D <b>G</b> -----	Y <b>G</b> E <b>L</b> F--S <b>S</b> E <b>N</b> R <b>V</b> D
<b>CCGaV</b>			-R <b>L</b> S <b>S</b> V <b>M</b> A <b>Y</b> C <b>P</b> L <b>V</b> S <b>S</b> -----	F <b>S</b> E <b>F</b> T <b>K</b> V <b>S</b> I <b>S</b> L <b>H</b> D <b>S</b> R <b>L</b> L <b>S</b> -----	K <b>T</b> C <b>V</b> -Q <b>S</b> A <b>D</b> F <b>N</b> S <b>N</b>
TBSV	NP_062900	<i>Tombusvirus</i>	-T <b>M</b> R <b>R</b> I <b>R</b> I <b>K</b> I <b>I</b> P <b>L</b> V <b>S</b> R-----	K <b>A</b> G <b>V</b> S <b>G</b> K <b>L</b> Y <b>L</b> R <b>D</b> I <b>S</b> D <b>T</b> T-----	G <b>R</b> K <b>L</b> H-C <b>T</b> E <b>S</b> L <b>D</b> L <b>G</b>
ToTV	YP_001040018	<i>Torradovirus</i>	-H <b>L</b> Y <b>G</b> V <b>M</b> F <b>F</b> M <b>V</b> P <b>H</b> V <b>H</b> G-----	G <b>E</b> G <b>S</b> V <b>K</b> I <b>S</b> L <b>C</b> S <b>S</b> N <b>D</b> P-----	T <b>N</b> P <b>V</b> L-Q <b>E</b> K <b>V</b> L <b>Y</b> F <b>S</b>
CaMV	NP_056724	<i>Caulimovirus</i>	-H <b>L</b> G <b>A</b> V <b>K</b> I <b>L</b> L <b>K</b> A <b>Q</b> F <b>R</b> N-----	G <b>I</b> D <b>T</b> P <b>I</b> K <b>I</b> A <b>L</b> I <b>D</b> D <b>R</b> I <b>N</b> S <b>R</b> -----	R <b>D</b> C <b>L</b> L-G <b>A</b> A <b>K</b> G <b>N</b> L <b>A</b>
CMV	NP_040776	<i>Cucumovirus</i>	-S <b>V</b> P <b>Q</b> V <b>L</b> C <b>A</b> V <b>T</b> R <b>I</b> V <b>S</b> T-----	D <b>A</b> E <b>G</b> S <b>L</b> R <b>I</b> Y <b>L</b> A <b>D</b> L <b>G</b> D <b>K</b> E <b>L</b> -----	S <b>P</b> I <b>D</b> G-Q <b>V</b> S <b>L</b> H <b>N</b> H
AMV	NP_041194	<i>Alfamovirus</i>	-H <b>H</b> S <b>A</b> I <b>Y</b> L <b>L</b> M <b>P</b> N <b>I</b> L <b>K</b> -----	S <b>S</b> S <b>G</b> S <b>I</b> T <b>L</b> K <b>L</b> F <b>N</b> E <b>A</b> T <b>G</b> E-----	L <b>V</b> D-V <b>D</b> T <b>D</b> H <b>D</b> A <b>T</b>
LNyV	YP_425089	<i>Cytorhabdovirus</i>	-H <b>I</b> G <b>C</b> I <b>T</b> V <b>S</b> I <b>E</b> P <b>L</b> L <b>H</b> Q <b>R</b> Y <b>M</b> K <b>N</b> F <b>G</b> K <b>T</b> I <b>A</b> G <b>N</b> C <b>A</b> I <b>D</b> S <b>T</b> F <b>R</b> K <b>V</b> -----		D <b>Q</b> S <b>I</b> I-S <b>L</b> H <b>K</b> Y <b>D</b> L <b>S</b>
AcVb	YP_004935360	<i>Vitivirus</i>	-H <b>L</b> G <b>C</b> V <b>A</b> I <b>A</b> V <b>I</b> P <b>H</b> G <b>R</b> -----	A <b>M</b> K <b>G</b> T <b>V</b> Q <b>I</b> K <b>V</b> E <b>D</b> Q <b>R</b> F <b>K</b> E-----	G <b>H</b> G <b>T</b> V-C <b>S</b> F <b>K</b> C <b>D</b> L <b>K</b>
CaLCuV	NP_624353	<i>Begomovirus</i>	-K <b>I</b> D <b>H</b> C <b>V</b> I <b>E</b> Y <b>R</b> Q <b>Q</b> V <b>P</b> I-----	N <b>A</b> T <b>G</b> S <b>V</b> I <b>V</b> E <b>I</b> H <b>D</b> K <b>R</b> M <b>T</b> D-----	D <b>E</b> S <b>L</b> Q-A <b>S</b> W <b>T</b> F <b>L</b> P <b>L</b> R

Figure S4. (Continue in the next page)

			eeeee	eee	e
TSWV	AEK06236	<i>Tospovirus</i>	DP-----ICFVF---YLN-----WSIPKM-----NNT-----PENCC		
RCNMV	NP_620546	<i>Dianthovirus</i>	AGK-----PCLMIF---SVH-----HQLNSD-----HEPF		
SBWMV	NP_049337	<i>Furovirus</i>	KGP-----NVMCF---FMH-----YSIPLN-----DKG-----RAVKL		
CMoV	YP_002302261	<i>Umbravirus</i>	SGP-----RLVAF---YPN-----YSIPLS-----DSAM-----NAPRCF		
CNSV	NP_733974	<i>Nepovirus B</i>	DGE-----ATMLQ---LPL-----LCEYVGHN---LQDFEA-----YKRSL		
OuMV	YP_002019758	<i>Ourmiavirus</i>	CTY-----TIQGT---VP-----YCLPFHPKEGGDVKSLE-----SQNPI		
PoLV	YP_009032637	<i>Aureovirus</i>	HGL-----VIEGS---QLP-----FCLPVG-----D-----YPL		
CPsV	YP_089663	<i>Ophiovirus</i>	QM-----AMVEL---SMN-----FVVEKK-----D-----MDFI		
CPMV	NP_734000	<i>Comovirus</i>	GGR-----PVRVVT---FPN-----TLAPVS-----CD-----LNNRF		
CiLV-C	YP_654542	<i>Cilevirus</i>	GGP-----CVVVM---NCA-----HSIPNE-----DRTHVNGSEVHRRL		
CRLV	YP_081449	<i>Cheravirus</i>	RDR-----CDLIS---LPL-----INFPLNK-----EDFDD-----YMRGL		
GFLV	NP_733995	<i>Nepovirus A</i>	NGL-----ARAFI---FPG-----LQYSQE-----EPR-----RESII		
RSV	NP_620519	<i>Tenuivirus</i>	KNF-----AVLGS---LAN-----FLALE-----DK-----HNL		
ACLSV	NP_040552	<i>Tricovirus</i>	SGS-----ATLVT---SPN-----FPVSLD-----DPG-----LSNSI		
SDV	NP_733976	<i>Sadwavirus</i>	AGW-----MRHTI---PIG-----ITVFTPT-----DPL-----VDRFL		
PYMoV	YP_008567619	<i>Badnavirus</i>	KGC-----QMVYI---IPD-----IMMTVN-----DF-----YHNI		
RRV	YP_004327592	<i>Emaravirus</i>	LMG-----TVITAVFPDPNFQQFVTGSLDFATDTK-----D-----INKI		
TMV	NP_597748	<i>Tobamovirus</i>	KKR-----FQFKV---VPN-----YAITTQ-----DA-----MKNVW		
CLBV	NP_624334	<i>Citriovirus</i>	KKQPF---ASKLLTI---NAAVD-----INCKVSVG-----SI		
PYFV	NP_734443	<i>Sequivirus</i>	GMQTHVYKTRMMAF---SRK-----EAIAAD-----RL		
RBDV	NP_620466	<i>Idaeovirus</i>	SG-----VIYCI---NVG-----YSVPKS-----EIDY		
<b>CCGaV</b>			IT-----QKVEL---SLD-----YCIPT-----SCSKI		
TBSV	NP_062900	<i>Tombusvirus</i>	REI-----RLTMQ---HLD-----FSVSTR-----SDVPI		
ToTV	YP_001040018	<i>Torradovirus</i>	GGA-----QAVLM---SPT-----ITLPPV-----KRG-----PMF		
CaMV	NP_056724	<i>Caulimovirus</i>	YGK-----FMFTV---YPK-----FGISLN-----TQR-----LNQTL		
CMV	NP_040776	<i>Cucumovirus</i>	DLP-----ALVSF---QPT-----YDCPME-----TVGN-----RKRCF		
AMV	NP_041194	<i>Alfamovirus</i>	QA-----CIFAG---RYP-----RSILAK-----DAA-----KGHDL		
LNYV	YP_425089	<i>Cytorhabdovirus</i>	RGR-----ADYVS---YPN-----HCLSLT-----DPM-----IQKRL		
AcVB	YP_004935360	<i>Vitivirus</i>	DAL-----SAYAS---FPG-----YFVSTT-----DVK-----NGYAL		
CaLCuV	NP_624353	<i>Begomovirus</i>	CNI-----DLHYF---SSS-----FFSLK-----DP-----IPW		
			eeeeeee	eeeeeee	
TSWV	AEK06236	<i>Tospovirus</i>	<b>QLHLMCSQ</b> ---EYKKG---VSFGSVMSW-----		
RCNMV	NP_620546	<i>Dianthovirus</i>	RVRITNTG--IPTK-KSYARCHAYW-----		
SBWMV	NP_049337	<i>Furovirus</i>	AFKIDAEM--ASKG-MSVMNVYSW-----		
CMoV	YP_002302261	<i>Umbravirus</i>	SLVTQLEGVRLQGG-ASAFSLYSMW-----		
CNSV	NP_733974	<i>Nepovirus B</i>	VLSTVFPFESGIADGKAMFGITSIEF---		
OuMV	YP_002019758	<i>Ourmiavirus</i>	RGIVYITDSRY-----		
PoLV	YP_009032637	<i>Aureovirus</i>	QFEVTVLQSQFRET-ANLYSTSVIEW-----		
CPsV	YP_089663	<i>Ophiovirus</i>	GIHVSAENVPVQD--RAYGSINLAF-----		
CPMV	NP_734000	<i>Comovirus</i>	KLICSLPNCDIVQG-SQVAEVSNNV-----		
CiLV-C	YP_654542	<i>Cilevirus</i>	GIQYQVDCDNISGR-VTFFSITALW-----		
CRLV	YP_081449	<i>Cheravirus</i>	YLCTMFHNVRGFQNNKALCSYSA-----		
GFLV	NP_733995	<i>Nepovirus A</i>	RLYVASTNATVDTD-SVLAASVGT-----		
RSV	NP_620519	<i>Tenuivirus</i>	QVSVSVDDSSVQNC---VISRTLWFW---		
ACLSV	NP_040552	<i>Tricovirus</i>	SVAVMFENLNFKFE-SYPISVRVGN-----		
SDV	NP_733976	<i>Sadwavirus</i>	RLSVLTGGSPMADG-RQVARLHYGL-----		
PYMoV	YP_008567619	<i>Badnavirus</i>	HISVLTTRGYEGWQHGEANLLVTRGM-----		
RRV	YP_004327592	<i>Emaravirus</i>	KFYISFPDTRM-----		
TMV	NP_597748	<i>Tobamovirus</i>	QVLVNIIRNVKMSAG-FCPLSLEFVSVCIIVY		
CLBV	NP_624334	<i>Citriovirus</i>	QVLELHGVDLREE-RSVAII-----		
PYFV	NP_734443	<i>Sequivirus</i>	QLYLYVKAKLERTQNTPI TVNVRT-----		
RBDV	NP_620466	<i>Idaeovirus</i>	KINIDFAGVPIKDG-KSPIWVKAFF-----		
<b>CCGaV</b>			TLNIAREQKFLQEG-EEWATVQLLIRL---		
TBSV	NP_062900	<i>Tombusvirus</i>	VFGFEELVSPFLEG-RELFISISRW-----		
ToTV	YP_001040018	<i>Torradovirus</i>	YYTMECLGTRA---QIPCSVVAIW-----		
CaMV	NP_056724	<i>Caulimovirus</i>	SLIHDFENKNLMNKGDKVMTITYVV-----		
CMV	NP_040776	<i>Cucumovirus</i>	AVVIERHGYIQYT--GTASVCSNW-----		
AMV	NP_041194	<i>Alfamovirus</i>	KLVVHAVASTNAN--SAVGVLPIW-----		
LNYV	YP_425089	<i>Cytorhabdovirus</i>	SVLLGIKIDVEPG-VELFSICIGY-----		
AcVB	YP_004935360	<i>Vitivirus</i>	NLKVKAEGMCMEVG-VHPLSIQMHC-----		
CaLCuV	NP_624353	<i>Begomovirus</i>	KLYYRVSDTNVHQR-THFAKFKGL-----		

**Figure S4. Multiple sequence alignment of movement proteins from citrus concave gum-associated virus (CCGaV) and plant viruses of the 30K superfamily. Sequences are from representative members of the virus genera in the 30K super-family. CCGaV is shown in bold.** The virus name, the GenBank identifier, the virus genus and the distance in amino acids from the N- terminus of the protein are shown on the left side of each sequence. Consensus secondary structure elements, predicted by PSIREED within the PROMALS3D program, are reported at the top with the strands and helices indicated with e and h, respectively. Amino acids that fold in helices and strands are in red and blue, respectively. The nearly invariant aspartic acid residue (the D motif) is shown in bold.