Appendix A | Primers used in this article

Primer	Sequence	Amplicon size (bp)	Tm (°C)
BrYV-F	TTCCGCCACTGCGGTAAGCT	~ 960	60
BrYV-R	TTGAGATGCATCTCAACCAACAGG		
CCYV-F	AAATTTAGCAACACATGAATGGG	~ 1240	55
CCYV-R	CTTCTGAGACTACGGTATCGAC		
CGMMV-	AGACGCTCATTTACTATCAACG	~ 1080	55
CGMMV-	AGACTCGACTACAGAAGCTC		
CMV-F	TCCGAATCAACCAGTGCTGG	~ 610	55
CMV-R	TGCTCGACGTCAACATGAAGT		
GYSV-F	CATCAGGCTATGGCATTTCTGGATAT	~ 740	60
GYSV-R	AGACTTGCAATAAACGAGTCTTTG		
LSEV-F	ATTCCTGGGCAACATTTAATGAT	~ 1280	55
LSEV-R	TACCTGGAATTCTGCAACCT		
MYSV-F	GAAAATCCAAGAACTTCTTAGTGG	~ 775	55
MYSV-R	CTTTACTCTTAGAAGAGCTCTCACC		
MABYV-	GCTACGAGGAATCGAGGAATG	~ 1300	55
MABYV-	AACAGAATTCCAGTTTTGAGGAC		
PRSV-F	TCAACGTCGGAACTAGTGGAAC	~ 700	55
PRSV-R	ATTACGCATACCCAGGAGAGAG		
SLCCNV-	GGTGGAAAAAACATATTCTCCGGA	~ 800	~ 60
SLCCNV-	AAAGTCGCGTAAACAGGGTTCGA		
TSV-F	TCCATCCAACGCCATGTCTT	~ 650	55
TSV-R	AAGGGAGCTGGTTTGGATATG		
WSMoV-F	GAACTTTTGGCTGGTGGTACAG	~ 600	55
WSMoV-	TGTTTGAACATAACATCCAAATCAT		
WVA-F	AATGGGAGGCTCAATAAATGTATT	~ 1350	55
WVA-R	GCATTCCTGCATCCTTCATT		
WMV-F	TCAATGAGGATGAAGCCAAGG	~ 1040	55
WMV-R	GTGTAGCGTTGCTATGATAAATCT		
WGMMV-	TGACCAGTCTATTCTGGACGT	~ 1200	55
WGMMV-	TAAGGCAGCAATTTCGAGAGT		
ZTMV-F	ACTGTTCCTCGAATTAAAACATTTA	~ 660	55
ZTMV-R	TCCAAGGAGAGAGTGCATGTC		
ZYMV-F	GATCACAAAGAAAATGTCATTGCC	~ 500	55
ZYMV-R	TGCTTTCATCTGCGCAACAG		

Appendix B | Types and number of single infection in cucurbit crops

Types of virus	Number of infected samples					
	Cucumber	Squash	Bottle gourd	White gourd	Luffa	Total
CCYV	3					3
CGMMV		1	6			7
MYSV	16	1				17
PRSV		15	1	1		17
SLCCNV		4	3			7
TSV	2	1				3
WSMoV	6	3		11		20
ZTMV		3	1	4		8
ZYMV	3	7		1	3	14

Appendix C | Types and number of double infection in cucurbit crops

Types of virus	Number of infected samples					
	Cucumber	Squash	Bottle gourd	White gourd	Luffa	Total
MYSV+CCYV	3					3
MYSV+ZTMV	2					2
PRSV+CCYV	2					2
PRSV+ZYMV	1	2				3
PRSV+ZTMV	1	3	2			6
MYSV+PRSV	1					1
MYSV+ZYMV	1					1
ZYMV+SLCCNV		4		1		5
TSV+SLCCNV		3		1		4
PRSV+CGMMV		3				3
ZTMV+CGMMV		2	1			3

PRSV+SLCCNV	2				2
ZYMV+ZTMV	2				2
TSV+WSMoV	1		1		2
ZTMV+WSMoV	1				1
CGMMV+WVA		7			7
CGMMV+WGMMV		2			2
LSEV+ZTMV		2			2
WVA+SLCCNV		1			1
LESV+SLCCNV		1			1
WSMoV+PRSV			5		5
WSMoV+ZYMV			2		2
WSMoV+CGMMV			2		2
CMV+BrYV				1	1

Appendix D | Types and number of triple infection in cucurbit crops

Types of virus	Number of infected samples					
	Cucumber	Squash	Bottle gourd	White gourd	Luffa	Total
PRSV+ZTMV+WSMoV	2			1		3
MYSV+ZTMV+CCYV	1					1
MYSV+PRSV+ZTMV	1					1
MYSV+PRSV+ZYMV	1					1
PRSV+CCYV+TSV	1					1
PRSV+ZYMV+CCYV	1					1
PRSV+ZYMV+ZTMV		5				5
PRSV+ZYMV+SLCCNV		4				4
ZTMV+SLCCNV+TSV		1				1
PRSV+SLCCNV+CCYV		1				1
ZYMV+ZTMV+SLCCNV		1				1

ZYMV+SLCCNV+CGMMV	1				1
WVA+LSEV+SLCCNV		1			1
CGMMV+WGMMV+LSEV		1			1
CGMMV+WGMMV+WVA		1			1
ZYMV+ZTMV+CGMMV		1			1
ZTMV+PRSV+LESV		1			1
WVA+LSEV+ZYMV		1			1
WSMoV+PRSV+TSV			2		2
ZYMV+PRSV+GYSV				3	3

Appendix E | Types and number of quadruple and quintuple infections in cucurbit crops

Types of virus	Number of infected samples					
	Cucumber	Squash	Bottle gourd	White gourd	Luffa	Total
PRSV+ZYMV+ZTMV+WSMoV	1	1				2
PRSV+ZYMV+ZTMV+CCYV		3				3
PRSV+ZYMV+ZTMV+WMV		2				2
PRSV+ZYMV+ZTMV+SLCCNV		1				1
CGMMV+WGMMV+WVA+LSEV			4			4
CGMMV+WGMMV+WVA+PRSV			1			1
CGMMV+WGMMV+PRSV+MYSV			1			1
WVA+LSEV+SLCCNV+CCYV			2			2
WVA+LSEV+ZYMV+ZTMV			1			1
WSMoV+PRSV+ZTMV+MABYV				1		1
PRSV+ZYMV+TSV+CCYV+CMV	1					1

CGMMV+WGMMV+WVA+LSEV+ZYMV	1	1
CGMMV+WGMMV+LSEV+ZTMV+PRSV	1	1

Appendix F Viruses used in the phylogenetic analyses

Virus	Abbreviation	Genus	Subfamily	Family
Watermelon green mottle mosaic virus isolate Huizhou	WGMMV-Huizhou	*Tobamovirus*		*Virgaviridae*
Watermelon green mottle mosaic virus isolate WT2	WGMMV-WT2	*Tobamovirus*		*Virgaviridae*
Watermelon green mottle mosaic virus isolate BM001	WGMMV-BM001	*Tobamovirus*		*Virgaviridae*
Cucumber mottle virus	CuMV	*Tobamovirus*		*Virgaviridae*
Cucumber green mottle mosaic virus isolate GDLZ	CGMMV-GDLZ	*Tobamovirus*		*Virgaviridae*
Cucumber fruit mottle mosaic virus	CFMMV	*Tobamovirus*		*Virgaviridae*
Cucumber fruit mottle mosaic virus isolate Cm	CFMMV-Cm	*Tobamovirus*		*Virgaviridae*
Kyuri green mottle mosaic virus isolate YM	KGMMV-YM	*Tobamovirus*		*Virgaviridae*
Zucchini green mottle mosaic virus isolate GXBG1	ZGMMV-GXBG1	*Tobamovirus*		*Virgaviridae*
Tobacco mosaic virus	TMV	*Tobamovirus*		*Virgaviridae*
Watermelon virus A	WVA	*Wamavirus*	*Trivirinae*	*Betaflexiviridae*
Apple stem grooving virus	ASGV	*Capillovirus*	*Trivirinae*	*Betaflexiviridae*
Carrot Ch virus 1	CChV-1	*Chordovirus*	*Trivirinae*	*Betaflexiviridae*
Citrus leaf blotch virus	CLBV	*Citrivirus*	*Trivirinae*	*Betaflexiviridae*
Dweet mottle virus	DMV	*Citrivirus*	*Trivirinae*	*Betaflexiviridae*
Haruka-associated citrivirus	HaCV	*Citrivirus*	*Trivirinae*	*Betaflexiviridae*
Diuris virus A	DiVA	*Divavirus*	*Trivirinae*	*Betaflexiviridae*
Apricot vein clearing associated virus	AVCaV	*Prunevirus*	*Trivirinae*	*Betaflexiviridae*
Actinidia seed-borne latent virus	AsbLV	*Prunevirus*	*Trivirinae*	*Betaflexiviridae*
Ribes americanum virus A	RAVA	*Ravavirus*	*Trivirinae*	*Betaflexiviridae*

Potato virus T	PVT	*Tepovirus*	*Trivirinae*	*Betaflexiviridae*
Apple chlorotic leaf spot virus	ACLSV	*Trichovirus*	*Trivirinae*	*Betaflexiviridae*
Cherry mottle leaf virus	CMLV	*Trichovirus*	*Trivirinae*	*Betaflexiviridae*
Grapevine virus A	GVA	*Vitivirus*	*Trivirinae*	*Betaflexiviridae*
Salvia divinorum RNA virus 1	SdRV1	*Unassigned*	*Unassigned*	*Betaflexiviridae*
Camellia japonica associated betaflexivirus 1	CjBV1	*Unassigned*	*Unassigned*	*Betaflexiviridae*
Gaillardia latent virus	GalLV	*Carlavirus*	*Quinvirinae*	*Betaflexiviridae*
Apple stem pitting virus	ASPV	*Foveavirus*	*Quinvirinae*	*Betaflexiviridae*
Cherry necrotic rusty mottle virus	CNRMV	*Robigovirus*	*Quinvirinae*	*Betaflexiviridae*
Banana mild mosaic virus	BanMMV	*Unassigned*	*Quinvirinae*	*Betaflexiviridae*
Sugarcane striate mosaic-associated virus	SCSMaV	*Unassigned*	*Quinvirinae*	*Betaflexiviridae*
Sclerotinia deltaflexivirus 1	SsDFV1	*Deltaflexivirus*		*Deltaflexiviridae*
Shallot virus X	ShVX	*Allexivirus*		*Alphaflexiviridae*
Potato virus X	PVX	*Potexvirus*		*Alphaflexiviridae*
Botrytis virus F	BVF	*Mycoflexivirus*		*Gammaflexiviridae*
Grapevine fleck virus	GFkV	*Maculavirus*		*Tymoviridae*
Maize rayado fino virus	MRFV	*Marafivirus*		*Tymoviridae*
Turnip yellow mosaic virus	TYMV	*Tymovirus*		*Tymoviridae*