

**Supplementary Table S1. The *Fusarium*-infecting mycoviruses.**

No.	Genus	Genome type	Mycovirus	Accession no.
1	<i>Chrysoviridae</i>	dsRNA	<i>Fusarium graminearum</i> mycovirus China 9(FgV-China 9)	dsRNA1:HQ282213; dsRNA2:HQ2228214; dsRNA3:HQ282215; dsRNA4:HQ2228216; dsRNA5:HQ282217
2	<i>Chrysoviridae</i>	dsRNA	<i>Fusarium graminearum</i> dsRNA mycovirus 2(FgV2)	dsRNA1:HQ343295; dsRNA2:HQ343296; dsRNA3:HQ3343297; dsRNA4:HQ343298;
3	<i>Chrysoviridae</i>	dsRNA	<i>Fusarium oxysporum</i> f. sp. <i>dianthi</i> mycovirus 1(FodV)	dsRNA1:KP876629; dsRNA2:KP876630; dsRNA3:KP876631; dsRNA4:KP876632
4	<i>Chrysoviridae</i>	dsRNA	<i>Fusarium sacchari</i> chrysovirus 1(FsCV1)	dsRNA1: MN295964; dsRNA2: MN295965; dsRNA3: MN295966; dsRNA4: MN295967
5	<i>Chrysoviridae</i>	dsRNA	<i>Fusarium oxysporum</i> chrysovirus 1(FoCV1)	dsRNA1:EF152346; dsRNA2:EF152347; dsRNA3:EF152348
6	<i>Megabirnaviridae</i>	dsRNA	<i>Fusarium pseudograminearum</i> megabirnavirus 1(FpgMBV1)	RNA1: MH057692 RNA2: MH057693
7	<i>Partitiviridae</i>	dsRNA	<i>Fusarium solani</i> virus 1(FsV1)	RNA1: NC_003885

				RNA2: NC_003886
<b>8</b>	<i>Partitiviridae</i>	dsRNA	Fusarium poae virus 1(FpV1)	RNA1: NC_003883 RNA2: NC_003884
<b>9</b>	<i>Partitiviridae</i>	dsRNA	Fusarium solani partitivirus 2(FsPV2)	LC006130
<b>10</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. Cubense partitivirus 1 (FocPV1)	OQ685981
<b>11</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 2 (FocPV2)	OQ685986
<b>12</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 3 (FocPV3)	OQ685982
<b>13</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 4 (FocPV4)	OQ685980
<b>14</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 5 (FocPV5)	OQ685983
<b>15</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 6 (FocPV6)	OQ685984
<b>16</b>	<i>Partitiviridae</i>	dsRNA	Fusarium oxysporum f. sp. cubense partitivirus 7 (FocPV7)	OQ685985
<b>17</b>	<i>Partitiviridae</i>	dsRNA	Fusarium mangiferae partitivirus 1 (FmPV1)	segment 1: MZ493897 segment 2: MZ493898
<b>18</b>	<i>Partitiviridae</i>	dsRNA	Fusarium mangiferae partitivirus 2 (FmPV2)	segment 1: MZ493899 segment 2: MZ493800
<b>19</b>	<i>Polymycoviridae</i>	dsRNA and ssRNA	Fusarium redolens polymycovirus 1(FrPmV1)	RNA1: MK609920 RNA2: MK609921 RNA3: MK609922 RNA4: MK609923 RNA5: MK609924 RNA6: MK609925 RNA7: MK609926 RNA8: MK609927
<b>20</b>	<i>Totiviridae</i>	dsRNA	Fusarium asiaticum victorivirus 1(FaVV1)	MH615042
<b>21</b>	<i>Alternaviridae</i>	dsRNA	Fusarium graminearum alternavirus 1(FgAV1)	MG254901
<b>22</b>	<i>Alternaviridae</i>	dsRNA	Fusarium incarnatum alternavirus 1(FiAV1)	MH899114

<b>23</b>	<i>Fusagraviridae</i>	dsRNA	<i>Fusarium poae</i> dsRNA virus 2(FpV2)	KU728180
<b>24</b>	<i>Fusagraviridae</i>	dsRNA	<i>Fusarium poae</i> dsRNA virus 3(FpV3)	KU728181
<b>25</b>	<i>Fusagraviridae</i>	dsRNA	<i>Fusarium virguliforme</i> dsRNA mycovirus 1(FvV1)	JN671444
<b>26</b>	<i>Fusagraviridae</i>	dsRNA	<i>Fusarium virguliforme</i> dsRNA mycovirus 2(FvV2)	JN671443
<b>27</b>	<i>Fusagraviridae</i>	dsRNA	<i>Fusarium graminearum</i> dsRNA mycovirus-3(FgV3)	NC_013469
<b>28</b>	<i>Curvulaviridae</i>	dsRNA	<i>Fusarium graminearum</i> dsRNA mycovirus-4(FgV4)	RNA1: NC_013470 RNA2: NC_013471
<b>29</b>	<i>Curvulaviridae</i>	dsRNA	<i>Fusarium graminearum</i> dsRNA mycovirus-5(FgV5)	RNA1: KX380787 RNA2: KX380788
<b>30</b>	<i>Deltaflexiviridae</i>	+ ssRNA	<i>Fusarium graminearum</i> deltaflexivirus 1(FgDFV1)	KX015962
<b>31</b>	<i>Endornaviridae</i>	+ ssRNA	<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> endornavirus 1 (FocEV1)	OQ685975
<b>32</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> ourmia-like virus 1 (FocOLV1)	OQ685967
<b>33</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> ourmia-like virus 2 (FocOLV2)	OQ685968
<b>34</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> ourmia-like virus 3 (FocOLV3)	OQ685970
<b>35</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium oxysporum</i> f. sp. <i>cubense</i> ourmia-like virus 4 (FocOLV4)	OQ685969
<b>36</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium asiaticum</i> ourmiavirus 2(FaOV2)	RNA1: MZ969060 RNA2: MZ969061
<b>37</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium asiaticum</i> ourmiavirus 1(FaOV1)	MZ969063
<b>38</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium mangiferae</i> botourmiavirus 1(FmBOV1)	MZ493907
<b>39</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium mangiferae</i> botourmiavirus 2(FmBOV2)	MZ493908
<b>40</b>	<i>Botourmiaviridae</i>	+ssRNA	<i>Fusarium mangiferae</i> botourmiavirus 3(FmBOV3)	MZ493909

<b>41</b>	<i>Hypoviridae</i>	+ ssRNA	Fusarium graminearum hypovirus 1(FgHV1)	KC330231
<b>42</b>	<i>Hypoviridae</i>	+ ssRNA	Fusarium graminearum hypovirus 2(FgHV2)	KP208178
<b>43</b>	<i>Hypoviridae</i>	+ ssRNA	Fusarium langsethiae hypovirus 1(FlHV1)	KY120321
<b>44</b>	<i>Hypoviridae</i>	+ ssRNA	Fusarium sacchari hypovirus 1(FsHV1)	MN295969
<b>45</b>	<i>Hypoviridae</i>	+ ssRNA	Fusarium sambucinum hypovirus 1 (FsamHV1)	NC_076613
<b>46</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium circinatum mitovirus 1(FcMV1)	KF803546
<b>47</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium globosum mitovirus 1(FgMV1)	LC006128
<b>48</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium boothii mitovirus 1(FbMV1)	LC425112
<b>49</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium andiyazi mitovirus 1(FaMV1)	MN295972
<b>50</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium andiyazi mitovirus 2(FaMV2)	MN295975
<b>51</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium sacchari mitovirus 1(FsMV1)	MN295976
<b>52</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium poae narnavirus 1(FpNV1)	NC_030865
<b>53</b>	<i>Narnaviridae</i>	+ ssRNA	Fusarium asiaticum narnavirus 1	MZ969062
<b>54</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium coeruleum mitovirus 1(FocMV1)	LC006129
<b>55</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium oxysporum f. sp. cubense mitovirus 1 (FocMV1)	OQ685973
<b>56</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium oxysporum f. sp. cubense mitovirus 2 (FocMV2)	OQ685971
<b>57</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium oxysporum f. sp. cubense mitovirus 3 (FocMV3)	OQ685974
<b>58</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium oxysporum f. sp. cubense mitovirus 4 (FocMV4)	OQ685972
<b>59</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 1	MZ969051
<b>60</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 2	MZ969052
<b>61</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 3	MZ969053
<b>62</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 4	MZ969054
<b>63</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 5	MZ969055
<b>64</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 6	MZ969056
<b>65</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 7	MZ969057

<b>66</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium asiaticum mitovirus 8	MZ969058
<b>67</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium poae mitovirus 1	MZ969059
<b>68</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 1 (FmMV1)	MZ493901
<b>69</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 2 (FmMV2)	MZ493902
<b>70</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 3 (FmMV3)	MZ493903
<b>71</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 4 (FmMV4)	MZ493904
<b>72</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 5 (FmMV5)	MZ493905
<b>73</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium mangiferae mitovirus 6 (FmMV6)	MZ493906
<b>74</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium verticillioides mitovirus 1 (FvMV1)	NC_076900
<b>75</b>	<i>Mitoviridae</i>	+ ssRNA	Fusarium andiyazi mitovirus 1 (FaMV1-162)	NC_076901
<b>76</b>	<i>Fusariviridae</i>	+ ssRNA	Fusarium asiaticum fusarivirus 1	MZ969065
<b>77</b>	<i>Fusariviridae</i>	+ ssRNA	Fusarium graminearum dsRNA mycovirus-1(FgV1)	NC_006937
<b>78</b>	<i>Fusariviridae</i>	+ ssRNA	Fusarium poae fusarivirus 2	OK524195
<b>79</b>	<i>Fusariviridae</i>	+ ssRNA	Fusarium pseudograminearum fusarivirus 1	OP100308
<b>80</b>	<i>Tymoviridae</i>	+ ssRNA	Fusarium graminearum mycotymovirus 1(FgMTV1)	KT360947
<b>81</b>	<i>Hadakaviridae</i>	+ ssRNA	Hadaka virus 1 (HadV1)	segment 1: LC519840 segment 2: LC519841 segment 3: LC519842 segment 4: LC519843 segment 5: LC519844 segment 6: LC519845 segment 7: LC519846 Segment t8: LC519847 segment 9: LC519848 segment 10: LC519849 segment 11: LC519850

<b>82</b>	<i>Mymonaviridae</i>	- ssRNA	Fusarium graminearum negative-stranded RNA virus 1(FgNSRV-1)	MF276904
<b>83</b>	<i>Mymonaviridae</i>	-ssRNA	Fusarium oxysporum f. sp. cubense mymonavirus 1 (FocMyV1)	OQ685977
<b>84</b>	<i>Mymonaviridae</i>	-ssRNA	Fusarium oxysporum f. sp. cubense negative-stranded RNA virus 1 (FocNSRV1)	OQ685978
<b>85</b>	<i>Phenuiviridae</i>	-ssRNA	Fusarium sibiricum coguvirus 1(FsCV1)	OQ295988
<b>86</b>	<i>Phenuiviridae</i>	-ssRNA	Fusarium asiaticum mycobunyavirus 1 (FaMBV1)	segment L: MZ969068 segment M: MZ969069 segment S: MZ969070
<b>87</b>	unassigned	+ ssRNA	Fusarium oxysporum f. sp. cubense alphavirus-like virus (FocALV)	OQ685976
<b>88</b>	unassigned	-ssRNA	Fusarium oxysporum f. sp. cubense negative-stranded RNA virus 2 (FocNSRV2)	OQ685979
<b>89</b>	unassigned	+ ssRNA	Fusarium boothii large flexivirus 1(FbLFV1)	LC425115
<b>90</b>	unassigned	+ ssRNA	Fusarium sacchari alphavirus-like virus 1(FsALV1)	MN295968
<b>91</b>	unassigned	-ssRNA	Fusarium asiaticum negative-stranded RNA virus 1(FaNSRV1)	MZ969066
<b>92</b>	unassigned	-ssRNA	Fusarium poae negative-stranded virus 1	LC150618
<b>93</b>	unassigned	-ssRNA	Fusarium poae negative-stranded virus 2	LC150619

**Supplementary Table S2.** The family Hypoviridae includes eight genera and 55 species.

Genus	No.	Virus protein for alignment	NCIB Accession number	Year
<b>Alphahypovirus</b>	1	Fusarium sacchari hypovirus 1 isolate LZ1	this study	2024
		Fusarium sacchari hypovirus 1 isolate LZ8	this study	2024
		Fusarium sacchari hypovirus 1 isolate LZ14	this study	2024
		Fusarium sacchari hypovirus 1 isolate FS18	this study	2024
		Fusarium sacchari hypovirus 1 isolate LZ12	this study	2024
		Fusarium sacchari hypovirus 1 isolate FSA1	this study	2024
		Fusarium sacchari hypovirus 1 isolate FS3	this study	2024
		Fusarium sacchari hypovirus 1 isolate FS66	this study	2024
		Fusarium sacchari hypovirus 1 isolate FS65	this study	2024
		Fusarium sacchari hypovirus 1 strain FZ06	MN295969	2020
		Fusarium sacchari hypovirus 1 isolate FS1	this study	2024
		Fusarium sacchari hypovirus 1 isolate FS9	this study	2024
	2	Wuhan insect virus 14	KX883007	2017
	3	Trichoderma asperellum hypovirus 1	MK279475	2019
	4	Alternaria alternata hypovirus 1	MK189193	2019
	5	Fusarium graminearum hypovirus 1	MK279472	2019
	6	Fusarium sambucinum hypovirus 1	LC596823	2022
	7	Bipolaris oryzae hypovirus 1	MH316122	2019
	8	Cryphonectria hypovirus 1	M57938	1995
	9	Cryphonectria hypovirus 2	L29010	1994
	10	Botrytis cinerea hypovirus 2	MN617169	2021
	11	Macrophomina phaseolina hypovirus 1	KP900893	2016

	12	Macrophomina phaseolina hypovirus 2	MT062425	2020
	13	Pestalotiopsis fici hypovirus 1	OP441373-OP441375	2022
	14	Trichoderma harzianum hypovirus 2	MW863664	2021
	15	Cercospora beticola hypovirus 1	MZ546195	2022
<b>Zetahypovirus</b>	16	Sclerotinia sclerotiorum hypovirus 6	MH766501	2018
<b>Deltahypovirus</b>	17	Beihai_hypolike_virus_1	KX883006	2017
	18	Beihai_sipunculid_worm_virus_6	KX883005	2017
<b>Epsilonhypovirus</b>	19	Agaricus bisporus virus 2	KY357507	2017
	20	Entoleuca hypovirus 1	MF375885	2018
	21	Rosellinia necatrix hypovirus 2	LC333733	2018
	22	Sclerotinia homoeocarpa hypovirus 1	MK279473	2023
	23	Rosellinia necatrix hypovirus 1	LC318482	2018
	24	Fusarium graminearum hypovirus 2	KP208178	2015
	25	Fusarium langsethiae hypovirus 1	KY120321	2016
	26	Fusarium poae hypovirus 1	LC150612	2018
<b>Betahypovirus</b>	27	Trichoderma harzianum hypovirus 1	MN172262	2019
	28	Cryphonectria hypovirus 4	AY307099	2019
	29	Setosphaeria turcica hypovirus 1	MK279474	2019
	30	Fusarium oxysporum dianthi hypovirus 2	MN176979	2020
	31	Valsa ceratosperma hypovirus 1	AB690372	2012
	32	Phomopsis longicolla hypovirus	KF537784	2014
	33	Cryphonectria hypovirus 3	AF188515	2000
	34	Botrytis cinerea hypovirus 1	MG554632	2018
	35	Botrytis cinerea hypovirus 3	MN617170	2021

	36	Sclerotinia sclerotiorum hypovirus 1	JF781304	2011
	37	Sclerotinia sclerotiorum hypovirus 1-A	MF444220	2018
	38	Botryosphaeria dothidea hypovirus 1 (BdHV1/SXD111)	OR387868	2023
	39	Colletotrichum camelliae hypovirus 1	OR077707	2023
<b>Thetahypovirus</b>	40	Botrytis cinerea hypovirus 5	MT157414	2021
	41	Sclerotinia sclerotiorum hypovirus 2	MH347276	2019
	42	Sclerotium rolfsii hypovirus 1	MH037014	2018
	43	Botrytis cinerea hypovirus 4	MN617171	2022
	44	Rhizoctonia solani hypovirus 1	MK558259	2019
<b>Gammahypovirus</b>	45	Sclerotium rolfsii hypovirus 7	MH766502	2018
	46	Sclerotium rolfsii hypovirus 5	MH766500	2018
	47	Sclerotium rolfsii hypovirus 4	MH766499	2018
	48	Sclerotium rolfsii hypovirus 2	MH766497	2018
	49	Sclerotium rolfsii hypovirus 3	MH766498	2018
<b>Etahypovirus</b>	50	Sclerotium rolfsii hypovirus 8	MH766503	2018
<b>unassigned</b>	51	Rhizoctonia zeae hypovirus 1	OQ559666	2023
	52	Rhizoctonia zeae hypovirus 2	OQ559672	2023
	53	Alternaria dianthicola hypovirus 1	ON843755	2022
	54	Sclerotinia sclerotiorum hypovirus 9	MW454884	2021
	55	Erysiphe necator associated hypovirus 2	MN558694	2021

**Supplementary Table S3.** Primers used in this study.

Primers for amplifying the full length of FsHV1			
	Primer Name	Sequence (5'→ 3')	Product size
<b>5'-RACE</b>	3'-GSP1	GGAGTCTCCAATCAGAGCAG	250 bp
	3'-GSP2	GAACAAGATGCAAGCTCTAACTG	
<b>Fragment 1</b>	197-F	GGCACTTGTGCCGTTACTC	1,530bp
	1627-R	CACCAACCTGACAACACTTGAG	
<b>Fragment 2</b>	1524-F	GCCACGAGGTATGTCAATCAC	1,554bp
	3078-R	CAACCACCAATCATCAGGGA	
<b>Fragment 3</b>	2991-F	CGGTGATGATTGGTTGCTTGA	494bp
	3485-R	GATAAGTAACCGCCACGAAGG	
<b>Fragment Defective</b>	FsHV1-DVF	GCACAATGGATGACACGAAGA	2,580bp
	FsHV1-DVR	GTAACCTGATTGAGACCTTCCG	
<b>Fragment 4</b>	5726-F	GTGAACCTAGTGCCAGTGCTTC	1,498bp
	7224-R	AGCACTACCAACTCACCCAACC	
<b>Fragment 5</b>	7102-F	CATACTGGAGGATTGGTGCA	1,611bp
	8713-R	CGGAGATATTCTTGAGCCATG	
<b>Fragment 6</b>	8564-F	CGAAAGACTCAATGATAACTGTGG	1,439bp
	10003-R	AGTCGTATTCTGGCTCGGTTA	
<b>Fragment 7</b>	9905-F	CAAGCGGTAAATGGCAAGAA	1,569bp
	11474-R	CTTTCTGAATAGCCTGGGACA	
<b>Fragment 8</b>	11370-F	CACTTACAACATGTGGACCGA	1,510bp
	12880-R	CGGCAGATTCTGGTTGATACAC	
<b>Fragment 9</b>	12486-F	TGCGTTCATGTTGGCTTGG	1,373bp
	13859-R	CATTCCTGGTGGCGTTGATAA	
<b>3'-RACE</b>	5'-GSP1	GCAGCCTAATAAGGTTCTCCGTGAA TG	450bp
	5'-GSP2	GCAAAGCCCACGGGAGGAAATCCC AC	
FsHV1 detection primer			
<b>RdRp</b>	FsHV1-RdRpF1	GCTCAAGGTGCTGATGGTGTT	1,733bp
	FsHV1-RdRpR1	AGCGACATTGTAAGCGTGACC	
<b>Defective</b>	FsHV1-DefectF	GCACAATGGATGACACGAAGA	2,500bp or 800bp
	FsHV1-DefectR	GTAACCTGATTGAGACCTTCCG	
Absolute quantitative primers			
<b>FsHV1-Defective</b>	FsHV1-qDF	CGGTTCTGCTTACGCTTTG	123bp
	FsHV1-qDR	AAGCAGGTTGATGCTCCAAT	
<b>FsHV1-RdRp</b>	FsHV1-RqF	CAGATGCAACGGCATTGAC	102bp
	FsHV1-RqR	TGCCATTACCGCTGGATGA	

<b>translation elongation factor 1-alpha (TEF-1α)</b>			
<b>EF-α</b>	EF1	ATGGGTAAGGARGACAAGAC	650 bp
	EF2	GGAAGTACCAAGTSATCATGTT	
<b>DNA-directed RNA polymerase II largest subunit</b>			
<b>RPB1</b>	Fa	CAYAARGARTCYATGATGGGWC	1,600bp
	G2R	GTCATYTGDGTDGCDGGYTCDC	
<b>DNA-directed RNA polymerase II second largest subunit</b>			
<b>RPB2</b>	5f2	GGGGWGAYCAGAAGAAGGC	1,800bp
	7cr	CCCATRGCTTGYTTRCCCAT	
	7cf	ATGGGYAARCAAGCYATGGG	
	11ar	GCRTGGATCTTRTCRTCSACC	

**Supplementary Table S4.** FsHV1-infected strains used in this study.

<b>Fusarium species</b>	<b>Strain</b>	<b>Sample source</b>	<b>Location</b>	<b>Year of collection</b>
<i>F. sacchari</i>	FZ06	Sugarcane diseased leaves	Fuzhou, Fujian	2012
<i>F. sacchari</i>	FS65	Sugarcane diseased leaves	Fusui, Guangxi	2019
<i>F. sacchari</i>	FS66	Sugarcane diseased leaves	Fusui, Guangxi	2019
<i>F. sacchari</i>	FS9	Sugarcane diseased leaves	Fusui, Guangxi	2019
<i>F. sacchari</i>	FS18	Sugarcane diseased leaves	Fusui, Guangxi	2019
<i>F. sacchari</i>	FS1	Sugarcane diseased leaves	Fusui, Guangxi	2017
<i>F. sacchari</i>	FSA1	Sugarcane diseased leaves	Fusui, Guangxi	2019
<i>F. sacchari</i>	LZ14	Sugarcane diseased leaves	Longzhou, Guangxi	2020
<i>F. sacchari</i>	LZ8	Sugarcane diseased leaves	Longzhou, Guangxi	2020
<i>F. andiyazi</i>	FS3	Sugarcane diseased leaves	Fusui, Guangxi	2017
<i>F. andiyazi</i>	LZ12	Sugarcane diseased leaves	Longzhou, Guangxi	2020
<i>F. solani</i>	LZ1	Rhizosphere soil of sugarcane	Longzhou, Guangxi	2020

**Supplementary Table S5.** The efficiency of horizontal transmission of FsHV1.

VIrus	Species of the donor strain	Species of the recipient strains	Successful transmission/Total number
<b>FsHV1-FZ06</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	18/30
<b>FsHV1-FS1</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	9/30
<b>FsHV1-FS9</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	10/30
<b>FsHV1-FS65</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	8/30
<b>FsHV1-FS66</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	4/30
<b>FsHV1-LZ8</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	5/30
<b>FsHV1-FSA1</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	8/30
<b>FsHV1-LZ14</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	8/30
<b>FsHV1-FS18</b>	<i>F. sacchari</i>	<i>F. sacchari</i>	9/30
<b>FsHV1-FS3</b>	<i>F. andiyazi</i>	<i>F. sacchari</i>	11/30
<b>FsHV1-LZ12</b>	<i>F. andiyazi</i>	<i>F. sacchari</i>	4/30
<b>FsHV1-LZ1</b>	<i>F. solani</i>	<i>F. sacchari</i>	3/30

**Supplementary Table S6.** Amino acid variation between FsHV1-A1 and the other 11 FsHV1 isolates

<b>Number</b>	<b>Position</b>	<b>Amino acids of FsHV1-A1</b>	<b>Amino acids of other 11 FsHV1 isolates</b>
<b>1</b>	259	G	E
<b>2</b>	438	S	N
<b>3</b>	494	F	I
<b>4</b>	708	C	H or Y or R
<b>5</b>	740	G	E
<b>6</b>	1708	G	D
<b>7</b>	1874	L	P
<b>8</b>	1934	P	S
<b>9</b>	2093	I	V
<b>10</b>	2792	G	V
<b>11</b>	2815	F	I
<b>12</b>	2859	S	R
<b>13</b>	2890	T	N
<b>14</b>	3155	N	K
<b>15</b>	3453	R	Q
<b>16</b>	3193	G	D
<b>17</b>	4202	I	V