

Supplementary Table 1. Primers used for virus detection by reverse transcription-polymerase chain reaction (RT-PCR) for different viruses included in the study.

Virus	Primer Name	Primer Sequence	Region	Amplicon Size (bp)	Reference		
Grapevine virus G	GVG-F6	5' ATAGCAGGAATGGGAGGGT 3'	Replicase	764	Voncina and Almeida (2018)		
	GVG-R6	5' CCTGGGGTAGATAGCACAG 3'					
	GVG-F12-CP	5' AGCATCCGGCTCAAAGTCA 3'	Coat Protein	646			
	GVG-R12-CP	5' ACACCATAACGGCTTAGCTCG 3'					
Grapevine virus H	GVH-RdRP-F1	5' ACTTGGCAATTCCTTCAAGTC 3'	Replicase	400	Diaz-Lara <i>et al.</i> (2019)		
	GVH-RdRP-R1	5' ACCTCAGGTTTGACATGTACCC 3'					
	GVH-CP-F1	5' ATCTCGAAAACCATCTTCGGGTA 3'	Coat Protein	400			
	GVH-CP-R1	5' TTCAGACCTTGGATCACAGTCG 3'					
	Det-F	5' TGGTCTGCAGCCAGGGACA 3'				Coat Protein and Movement Protein	588
	Det-R	5' TCACGACCCGGCAGGGAAGGA 3'					
Grapevine leafroll-associated virus 1	GLRaV1-M3	5' TCTTTACCAACCCCGAGATGAA 3'	Coat Protein	232	Fazeli <i>et al.</i> (2000)		
	GLRaV1-M4	5' GTGCTGGTGACGTGCTAAAACG 3'					
Grapevine leafroll-associated virus 2	GLRaV2-CP1	5' GGTGATAACCCGACGCCCTCTA 3'	Coat Protein	543	Direct submission		
	GLRaV-CP2	5' CCTAGCTGACGGCAGATTGCT 3'					
Grapevine leafroll-associated virus 3	GLRaV3-M3	5' TACGTTAAAGACGGGACACACAGG 3'	Coat Protein	336	Ling <i>et al.</i> (1998)		
	GLRaV3-N2	5' TCGGGCAITTAATCTTCATTG 3'					
Grapevine fanleaf virus	GFLV-M3	5' ATGCTGGATATCGTGACCCCTGT 3'	Replicase	118	Margis <i>et al.</i> (1994)		
	GFLV-M4	5' GAAGGTAIGCCCTGCTTCAGTGG 3'					
Arabic mosaic virus	ARMV-9	5' TGACAACATGGTATGAAGCACACA 3'	Replicase	402	Wetzel <i>et al.</i> (2004)		
	ARMV-10	5' TATAGGGCCCTTTCATCACGGAAT 3'					
Grapevine virus A	GVA-6591F	5' GAGGTAGATATAGTAGGACCTA 3'	Coat Protein	272	Minafra <i>et al.</i> (1994)		
	GVA-6862R	5' TCGAACATAACCTGTGGCTC 3'					
Grapevine virus B	GVB-M1	5' GTGCTAAGAACGTTTCACAGC 3'	Putative RNA-binding protein	460	Saldarelli <i>et al.</i> (1996)		
	GVB-M2	5' ATCAGCAAACACGGTTGAACCG 3'					
Grapevine fleck virus	GFKV-M1	5' TGACCAGCCTGTGTCTCTA 3'	Coat Protein	179	Sabanadzovic <i>et al.</i> (2001)		
	GFKV-M2	5' TGGACAGGGAGGTGTAGGAG 3'					

Supplementary Table 2. Partial sequences (CP = Coat Protein and RdRP = Replicase) of GVG and GVH used to construct phylogenetic trees in this study. Sequences are from GenBank, whereas sequences from the Sardinian isolates used in this study are listed below the table.

Accession number	Isolate	Country	Reference	Region
NC_040616	VID561	New Zealand	Blouin <i>et al.</i> (2017) ^a	GVG CP
MF405925	VID-567	New Zealand	Blouin <i>et al.</i> (2017) ^a	GVG CP
MF405924	VID499	New Zealand	Blouin <i>et al.</i> (2017) ^a	GVG CP
MF993573	VB-108	Croatia	Vončina and Almeida (2018)	GVG CP
NC_040554	VLJ-178	Croatia	Vončina and Almeida (2018)	GVG CP
MF993575	VVL-101	Croatia	Vončina and Almeida (2018)	GVG CP
MF993574	VD-102	Croatia	Vončina and Almeida (2018)	GVG CP
NC_040545	TT2016-3	Portugal	Candresse <i>et al.</i> (2018)	GVH CP
MN716768	Cultivated-TN1	United States of America	Hu <i>et al.</i> (2021)	GVH CP
MK838928	GT5468	Germany	Diaz <i>et al.</i> (2019)	GVH CP
MK838927	VR5454	Germany	Diaz <i>et al.</i> (2019)	GVH CP
MK838926	GC5462	Romania	Diaz <i>et al.</i> (2019)	GVH CP
MK838925	BA5076	Pakistan	Diaz <i>et al.</i> (2019)	GVH CP
MK838924	MI5074	Pakistan	Diaz <i>et al.</i> (2019)	GVH CP
MK838923	KA5072	Pakistan	Diaz <i>et al.</i> (2019)	GVH CP
MK838922	KY5070	Pakistan	Diaz <i>et al.</i> (2019)	GVH CP
MK838921	CA4881	United States of America	Diaz <i>et al.</i> (2019)	GVH CP
MK838920	TG4470	Turkey	Diaz <i>et al.</i> (2019)	GVH CP
MK838918	TB6385	France	Diaz <i>et al.</i> (2019)	GVH CP
MK838917	SM5410	Republic of Serbia	Diaz <i>et al.</i> (2019)	GVH CP
MK838916	PE5392	United States of America	Diaz <i>et al.</i> (2019)	GVH CP
MK838915	TS4666	United States of America	Diaz <i>et al.</i> (2019)	GVH CP
MK838914	ME5390	Austria	Diaz <i>et al.</i> (2019)	GVH CP
MK838912	KO5386	Greece	Diaz <i>et al.</i> (2019)	GVH CP
MK838911	PC4591	United States of America	Diaz <i>et al.</i> (2019)	GVH CP
MK838909	BH4436	Denmark	Diaz <i>et al.</i> (2019)	GVH CP
MK838906	BD4430	United States of America	Diaz <i>et al.</i> (2019)	GVH CP
OK474823.1	Malvazija istarska	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474826.1	Brajdica bijela	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474828.1	Bljuzgavac	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474830.1	Kozjak	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474829.1	Svrdlovina crna	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474822.1	Gustopupica	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474824.1	Muskatel	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474825.1	Babica plosnata	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
OK474827.1	Plavcina	Croatia	Jagunić <i>et al.</i> (2021)	GVH CP
NC_040545	TT2016-3	Portugal	Candresse <i>et al.</i> (2018)	GVH RdRP
MN716768	Cultivated-TN1	United States of America	Hu <i>et al.</i> (2021)	GVH RdRP
MK017760	GT5468	Germany	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017758	GC5462	Romania	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017757	BA5076	Pakistan	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017753	CA4881	United States of America	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017752	TG4470	Turkey	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017750	TB6385	France	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017749	SM5410	Republic of Serbia	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017746	ME5390	Austria	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017744	KO5386	Greece	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017743	PC4591	United States of America	Diaz <i>et al.</i> (2019)	GVH RdRP

(Continued)

Supplementary Table 2. (Continued).

Accession number	Isolate	Country	Reference	Region
MK017742	BM4438	United States of America	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017741	BH4436	Denmark	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017738	BD4430	United States of America	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017736	AV5541	Portugal	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017735	PM4595	Republic of South Africa	Diaz <i>et al.</i> (2019)	GVH RdRP
MK017725	MP4740	United States of America	Diaz <i>et al.</i> (2019)	GVH RdRP
OK474818.1	Plavcina	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474820.1	Svrdlovina crna	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474813.1	Gustopupica	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474815.1	Muskatel	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474821.1	Kozjak	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474819.1	Bljuzgavac	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474816.1	Babica plosnata	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474817.1	Brajdica bijela	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
OK474814.1	Malvazija istarska	Croatia	Jagunić <i>et al.</i> (2021)	GVH RdRP
MZ682351	RSA-05-03-Azal-tinto_GVN	South Africa	Read <i>et al.</i> (2022)	GVM CP
MK492703	TX-WAT	USA	Alabi <i>et al.</i> (2019)	GVN CP
MK492703	TX-WAT	USA	Alabi <i>et al.</i> (2019)	GVN RdRp

^a direct submission.

GVG – CP

>OLM 14 VRM

GAGCCATCTTCTGATGAAGAGAAGGAGCTTAATCATAATATACTTAGTAATATATTCGGTAATATAGGTATAATAGGGAC-TAGTGCTAAAATAAGTAATTATCCAGAGTCAATAAAGTGCTATGATCTCTCTGCTGGGCGCTTAAATCCGAACTTCTCAA-GGGTGAGGATATTAATTTGGGGGAGATTTTAGTAACCATGATAGTGGTCTCTAAAGCTGCTGATGGTCCTCCAATGGGTG-GTGCCACATTACGTCAAATGTGTGAACCCCTTTGCTAATGAGGCTTACCATTATCTGAAGGCTGCGGCTAACAGTGGGGTT-TACACAACTTGGCTAAGAAGATGACAAGGGCAGGGAACAAGGAGCCCCAGGTAATGTTTGACTTTTCAAAGGGTCTTG-CAATATCTAGGCTCACACGCTCTGAGGCCAGTGTTATGCAGGTCATGCATCAGCGTGTCTTTTCGAACTGAGGGCGCCAAA-GGTGTATTCGAAGCTCAAAGCAACGTGGCCGAAGGACCTGTGGAGGTTTAGCTTGAGGCAGTTAGGTGGCTTACTATAT-CATTGATAATGGAAAGATTAGGTGAGTCTAAGAGTGCTGCTAAACGT

>OLM 17 VRM

GAGCCATCTTCTGATGAAGAGAAGGAGCTTAATCATAATATACTTAGTAATATATTCGGTAATATAGGTATAATAGGGAC-TAGTGCTAAAATAAGTAATTATCCAGAGTCAATAAAGTGCTATGATCTCTCTGCTGGGCGCTTAAATCCGAACCTTCTCAA-GGGTGATGATATTAATTTGGGGGAGATTTTAGTAACCATGATAGTGGTCTCTAAAGCTGCTGATGGTCCTCCAATGGGTG-GTGCTACATTACGTCAAATGTGTGAACCCCTTTGCTAATGAGGCTTACCATTATCTGAAGGCTGCGGCTAACAGTGGGGTT-TACACAACTTGGCTAAGAAGATGACAAGGGCAGGGAACAAGGAGCCCCAGGTAATGTTTGACTTTTCAAAGGGTCTTG-CAATATCTAGGCTCACACGCTCTGAGGCCAGTGTTATGCAGGTCATGCATCAGCGTGTCTTTTCGAACAGAGGGCGCCAAA-GGTGTATTCGAAGCTCAAAGCAACGTGGCCGAAGGACCTGTGGAGGTTTAGCTTGAGGCAGTTAGGTGGCTTACTATAT-CATTGATAATGGAAAGATTAGGTGAGTCTAAGAGTGCTGCTAAACGT

>NAR 36 CRG

GAGCCATCTTCTGATGAAGAGAAGGAGCTTAATCATAATATACTTAGTAATATATTCGGTAATATAGGTATAATAGGGAC-TAGTGCTAAAATAAGTAATTATCCAGAGTCAATAAAGTGCTATGATCTCTCTGCTGGGCGCTTAAATCCGAACCTTCTCAA-GGGTGAGGATATTAATTTGGGAGAGATTTTAGTAACCATGATAGTGGTCTCTAAAGCTGCTGATGGTCCTCCAATGGGTG-GTGCCACATTACGTCAAATGTGTGAACCCCTTTGCTAATGAGGCTTACCATTATCTGAAGGCTGCAGCTAACAGTGGTGT-TACACAACTTGGCGAAGAAGATGACAAGGGCAGGGAACAAGGAGCCCCAGGTAATGTTTGACTTTTCAAAGGGTCTTG-CAATATCTAGGCTCACACGCTCTGAGGCCAGTGTTATGCAGGTCATGCATCAGCGTGTCTTTTCGAACTGAGGGCGCCAAA-GGTGTATTCGAAGCTCAAAGCAACGTGGCCGAAGGACCTGTGGAGGTTTAGCTTGAGGCAGTTAGGTGGCTTACTATAT-CATTAATAATGGAAAGATTAGGTGAGTCTAAGAGTGCCGCTAAACGT

>NAR 37 CRG

GAGCCATCTTCTGATGAAGAGAAGGAGCTTAATCATAATATACTTAGTAATATATTCGGTAATATAGGTATAATAGGGAC-TAGTGCTAAAATAAGTAATTATCCAGAGTCAATAAAGTGCTATGATCTCTCTGCTGGGCGCTTAAATCCGAACCTTCTCAA-GGGTGAGGATATTAATTTGGGAGAGATTTTAGTAACCATGATAGTGGTCTCTAAAGCTGCTGATGGTCCTCCAATGGGTG-

GTGCCACATTACGTCAAATGTGTGAACCCTTTGCTAATGAGGCTTACCATTATCTGAAGGCTGCAGCTAACAGTGGTGTT-
TACACAAACTTGGCGAAGAAGATGACAAGGGCAGGGAACAAGGAGCCCCAGGTAATGTTTGACTTTTCAAAGGGTCTTG-
CAATATCTAGGCTCACACGCTCTGAGGCCAGTGTTATGCAGGTCATGCATCAGCGTGTCTTTCGAACTGAGGGCGCCAAA-
GGTGTATTTCGAAGCTCAAAGCAACGTGGCCGAAGGACCTGTGGAGGTTTAGCTTGAGGCAGTTAGGTGGCTTACTATAT-
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GVH-RdRp

>NAR 38 CRG

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AAGAGTGGGACCAGGTATCCGGGAAGGGTATCTAATGAAGCTGAGGGAAGTATCGCCAGTCTGAGCCGTACTCTT-
GCTCAGGATTCAGCGGACTGGATAGATGGAACAACCTCCATCTCTTTGATCAAAGCCGCTCGGAAGGCTTTTGAAGAATC-
CAGGCCCGCTGAACCGGAGTACAACAAGGTAGTGCCTATCAACATGGAG

GVH-CP

>NAR 38 CRG

TATAGCCATCACTGGAACGTCAAAGAAGGCCGAGCATTACGGGGAGGTGGATATCTTAGGACCTAAGACTAATAGGGA-
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CACCGGCTGCTAAGGCTACATTAAGGCAAATGTGCGAACCATTTCGCACATGAGGCTTATGTATTCCTAACTCGCGGCGCG-
GCGTTGGGCATATTCACTCAGCTGGCAGTTAAGATAGCGCGTTTAGGTAATAAAGAACCACAGGTCATGTTTCGACTTCAA-
CAGTGGTTTGGATCTGACTTCTCTCACTCTGCAGGAAG