



FMD Genotyping Report

Lab Reference WRL batch Number: WRLFMD/2021/00019

Sender Details:

[REDACTED]

Date Received: 21/12/2021

Country of Origin*: PAKISTAN

Sequencing work has now been completed in respect of the samples you submitted and the details are as attached. Please note that all of our phylogenetic trees can be accessed via the internet at: <http://www.wrlfmd.org/>

Result: [REDACTED]

Official Stamp:

Date:

25/3/2022

[REDACTED]

[REDACTED]

To help us improve the quality of our service, please send any suggestions or requests to the Reference Laboratory by email (reflabsfeedback@pirbright.ac.uk).

* Data supplied by the customer

FAO World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD)

Genotyping Report

FMDV serotype: O
Country: Pakistan
Year: 2019, 2020
Batch: WRLFMD/2021/00019
No. of sequences: 5
Report date: 11th February 2022
Report generated by: Nick Knowles
Report checked by: Jemma Wadsworth



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www: <http://www.wrlfmd.org/>

email: reporting@pirbright.ac.uk

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Virus sample name:	PAK/78/2019
Sender reference:	FMDV O/LKM/KPK/PAK/255/2019 LFBK2
Location of origin:	Lakki Marwat District, Bannu Division, Khyber Pakhtunkhwa Province
Country of origin:	Pakistan
Date of collection:	24/12/2019
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	15/01/2021
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	08/02/2022
Created:	10/02/2022
Last updated:	10/02/2022
VIBASys IDs: sample 50141, genome 50142, sequence viba_50143, sequencing info 50144	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50147	PAK/4/2020	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_50151	PAK/5/2020	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_50155	PAK/6/2020	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_50159	PAK/7/2020	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44941	PAK/74/2019	water buffalo	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_44945	PAK/3/2020	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_42512	PAK/32/2019	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_48434	IRN/22/2020	bovine	96.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_39743	VRI/CAMB/Faislabad1/PUN/PAK	cattle	96.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_39040	NIAB/PUN/PAK/205/2017	water buffalo	96.7	0	O	ME-SA	PanAsia-2	ANT-10

Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		92.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	90.2	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		90.2	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	89.9	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	89.7	0	O	ME-SA	PanAsia-2	BAL-09
viba_354	PAK/16/2010	cattle	89.7	0	O	ME-SA	PanAsia-2	PUN-10
viba_505	TUR/264/2009		89.3	0	O	ME-SA	PanAsia-2	SAN-09
viba_285	UKG/35/2001	porcine	89.3	0	O	ME-SA	PanAsia	
viba_860	IRN/6/2015	cattle	88.8	0	O	ME-SA	PanAsia-2	QOM-15
viba_293	BHU/3/2009	cattle	88.2	0	O	ME-SA	Ind-2001	d

Virus sample name:	PAK/4/2020
Sender reference:	FMDV O/KOH/KPK/PAK/272/2020 LFBK1
Location of origin:	Kohat District, Kohat Division, Khyber Pakhtunkhwa Province
Country of origin:	Pakistan
Date of collection:	19/01/2020
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	15/01/2021
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	08/02/2022
Created:	10/02/2022
Last updated:	10/02/2022
VIBASys IDs: sample 50145, genome 50146, sequence viba_50147, sequencing info 50148	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50151	PAK/5/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50155	PAK/6/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50159	PAK/7/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50143	PAK/78/2019	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44941	PAK/74/2019	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44945	PAK/3/2020	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_42512	PAK/32/2019	cattle	97.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_48434	IRN/22/2020	bovine	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_39743	VRI/CAMB/Faislabad1/PUN/PAK	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_39040	NIAB/PUN/PAK/205/2017	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		92.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	90.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		90.7	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	90.4	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_354	PAK/16/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_285	UKG/35/2001	porcine	89.8	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		89.7	0	O	ME-SA	PanAsia-2	SAN-09
viba_860	IRN/6/2015	cattle	89.3	0	O	ME-SA	PanAsia-2	QOM-15
viba_293	BHU/3/2009	cattle	88.6	0	O	ME-SA	Ind-2001	d

Virus sample name:	PAK/5/2020
Sender reference:	FMDV O/KOH/KPK/PAK/270/2020 LFBK2
Location of origin:	Kohat District, Kohat Division, Khyber Pakhtunkhwa Province
Country of origin:	Pakistan
Date of collection:	20/01/2020
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	15/01/2021
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	08/02/2022
Created:	10/02/2022
Last updated:	10/02/2022
VIBASys IDs: sample 50149, genome 50150, sequence viba_50151, sequencing info 50152	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50147	PAK/4/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50155	PAK/6/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50159	PAK/7/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50143	PAK/78/2019	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44941	PAK/74/2019	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44945	PAK/3/2020	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_42512	PAK/32/2019	cattle	97.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_48434	IRN/22/2020	bovine	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_39743	VRI/CAMB/Faislabad1/PUN/PAK	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_39040	NIAB/PUN/PAK/205/2017	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		92.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	90.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		90.7	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	90.4	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_354	PAK/16/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_285	UKG/35/2001	porcine	89.8	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		89.7	0	O	ME-SA	PanAsia-2	SAN-09
viba_860	IRN/6/2015	cattle	89.3	0	O	ME-SA	PanAsia-2	QOM-15
viba_293	BHU/3/2009	cattle	88.6	0	O	ME-SA	Ind-2001	d

Virus sample name:	PAK/6/2020
Sender reference:	FMDV O/KOH/KPK/PAK/264/2020 LFBK2
Location of origin:	Kohat District, Kohat Division, Khyber Pakhtunkhwa Province
Country of origin:	Pakistan
Date of collection:	27/01/2020
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	15/01/2021
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	08/02/2022
Created:	10/02/2022
Last updated:	10/02/2022
VIBASys IDs: sample 50153, genome 50154, sequence viba_50155, sequencing info 50156	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50147	PAK/4/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50151	PAK/5/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50159	PAK/7/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50143	PAK/78/2019	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44941	PAK/74/2019	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44945	PAK/3/2020	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_42512	PAK/32/2019	cattle	97.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_48434	IRN/22/2020	bovine	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_39743	VRI/CAMB/Faislabad1/PUN/PAK	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_39040	NIAB/PUN/PAK/205/2017	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		92.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	90.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		90.7	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	90.4	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_354	PAK/16/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_285	UKG/35/2001	porcine	89.8	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		89.7	0	O	ME-SA	PanAsia-2	SAN-09
viba_860	IRN/6/2015	cattle	89.3	0	O	ME-SA	PanAsia-2	QOM-15
viba_293	BHU/3/2009	cattle	88.6	0	O	ME-SA	Ind-2001	d

Virus sample name:	PAK/7/2020
Sender reference:	FMDV O/KOH/KPK/PAK/276/2020 LFBK1
Location of origin:	Kohat District, Kohat Division, Khyber Pakhtunkhwa Province
Country of origin:	Pakistan
Date of collection:	27/01/2020
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	25/01/2022
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	08/02/2022
Created:	10/02/2022
Last updated:	10/02/2022
VIBASys IDs: sample 50157, genome 50158, sequence viba_50159, sequencing info 50160	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50147	PAK/4/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50151	PAK/5/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50155	PAK/6/2020	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_50143	PAK/78/2019	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44941	PAK/74/2019	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_44945	PAK/3/2020	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_42512	PAK/32/2019	cattle	97.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_48434	IRN/22/2020	bovine	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_39743	VRI/CAMB/Faislabad1/PUN/PAK	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_39040	NIAB/PUN/PAK/205/2017	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

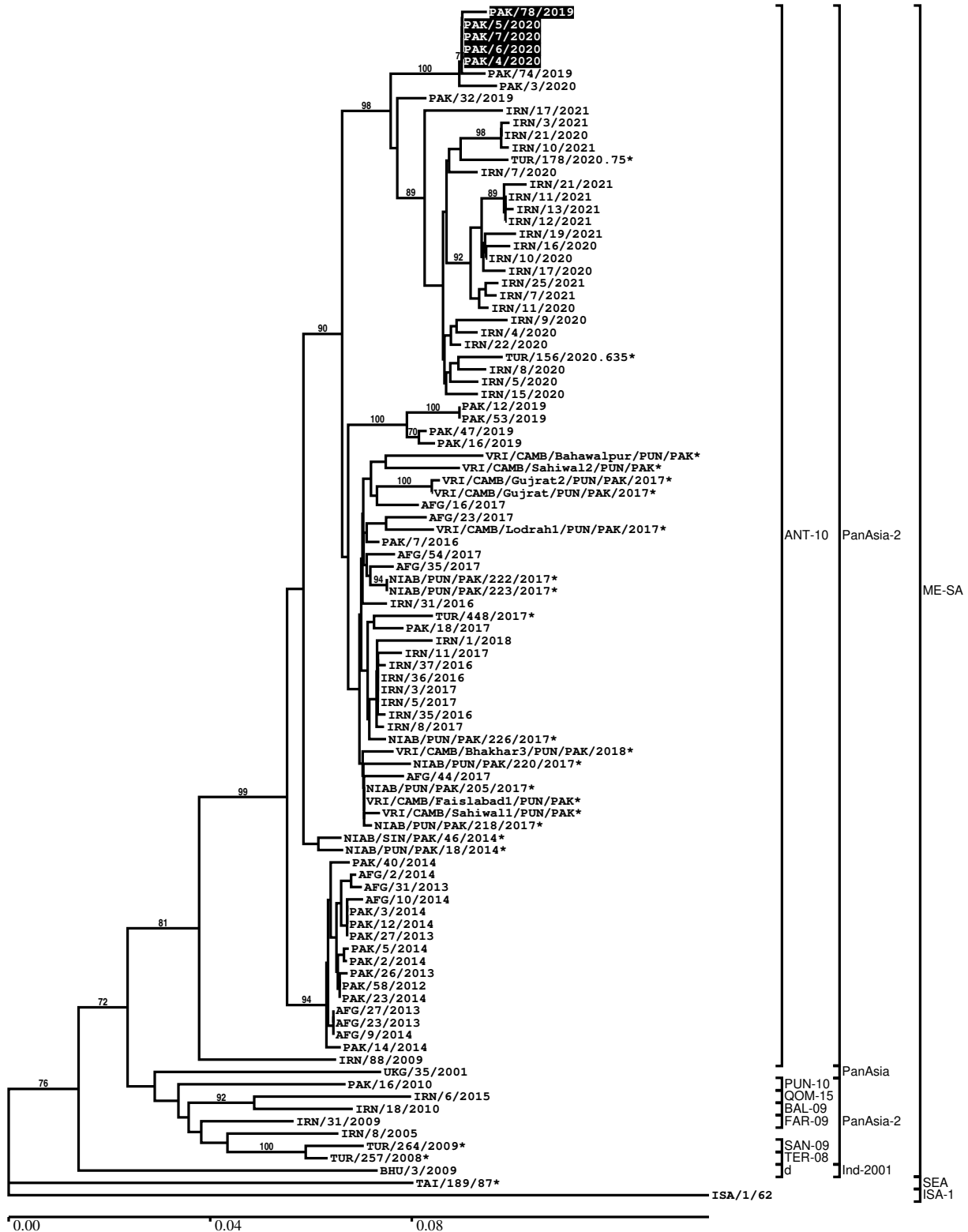
Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		92.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	90.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		90.7	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	90.4	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_354	PAK/16/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_285	UKG/35/2001	porcine	89.8	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		89.7	0	O	ME-SA	PanAsia-2	SAN-09
viba_860	IRN/6/2015	cattle	89.3	0	O	ME-SA	PanAsia-2	QOM-15
viba_293	BHU/3/2009	cattle	88.6	0	O	ME-SA	Ind-2001	d

Report on FMDV O in Pakistan in 2019, 2020

Batch: WRLFMD/2021/00019



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLFMD/2021/00019-Pakistan-O (5 sequences)
Sequence database set:	allseqs_O (5522 sequences)
Prototype sequence set:	!prototypes_O (49 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	636
Phylogeny reconstruction method:	fdnadist, fneighbor
Number of bootstrap samples:	1000
Random seed for bootstrapping:	1
Displaying bootstrap values above:	70.0%
Number of sequences in tree capped at:	100
Number of prototype sequences in tree:	10
VIBASys version:	reflabs-1.1.2

Sequences in the Phylogenetic Tree

All sequences in the tree are in taxonomic group FMDV/O

label	accession	host(s)	lab	country	taxonomic information
PAK/78/2019	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/5/2020	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/7/2020	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/6/2020	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/4/2020	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/74/2019	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/3/2020	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/32/2019	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
IRN/17/2021	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/3/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/21/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/10/2021	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
TUR/178/2020.75*	n/a	cattle	FMDI	Turkey	ME-SA/PanAsia-2/ANT-10
IRN/7/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/21/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/11/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/13/2021	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/12/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/19/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10

continued on next page

label	accession	host(s)	lab	country	taxonomic information
IRN/16/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/10/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/17/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/25/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/7/2021	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/11/2020	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/9/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/4/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/22/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
TUR/156/2020.635*	n/a	cattle	FMDI	Turkey	ME-SA/PanAsia-2/ANT-10
IRN/8/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/5/2020	n/a	bovine	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/15/2020	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
PAK/12/2019	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/53/2019	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/47/2019	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/16/2019	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Bahawalpur/PUN/PAK*	MK292141	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Sahiwal2/PUN/PAK*	MK292146	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Gujrat2/PUN/PAK/2017*	MK342183	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Gujrat/PUN/PAK/2017*	MK342182	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/16/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/23/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Lodrah1/PUN/PAK/2017*	MK342179	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/7/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/54/2017	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/35/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/222/2017*	MH085206	n/a	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/223/2017*	MH085207	n/a	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
IRN/31/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
TUR/448/2017*	n/a	sheep	FMDI	Turkey	ME-SA/PanAsia-2/ANT-10
PAK/18/2017	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
IRN/1/2018	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/11/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/37/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10

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label	accession	host(s)	lab	country	taxonomic information
IRN/36/2016	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/3/2017	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/5/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/35/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/8/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/226/2017*	MH085208	n/a	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Bhakhar3/PUN/PAK/2018*	MK342186	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/220/2017*	MH085205	n/a	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/44/2017	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/205/2017*	MF140436	water buffalo	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Faisalabad1/PUN/PAK*	MK292142	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
VRI/CAMB/Sahiwal1/PUN/PAK*	MK292143	cattle	VRI-CAMB	Pakistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/218/2017*	MH085204	n/a	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
NIAB/SIN/PAK/46/2014*	MF374989	cattle	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
NIAB/PUN/PAK/18/2014*	MF374991	cattle	NIAB	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/40/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/2/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/31/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/10/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/3/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/12/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/27/2013	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/5/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/2/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/26/2013	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/58/2012	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/23/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/27/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/23/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/9/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/14/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
IRN/88/2009	KY091282	n/a	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
UKG/35/2001	AJ539141	porcine	PIADC	United Kingdom	ME-SA/PanAsia
PAK/16/2010	KY091285	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/PUN-10
IRN/6/2015	MN276044	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/QOM-15

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label	accession	host(s)	lab	country	taxonomic information
IRN/18/2010	KY091283	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/BAL-09
IRN/31/2009	KY091284	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/FAR-09
IRN/8/2005	KY091281	ovine	WRLFMD	Iran	ME-SA/PanAsia-2
TUR/264/2009*	n/a	n/a	FMDI-Ankara	Turkey	ME-SA/PanAsia-2/SAN-09
TUR/257/2008*	n/a	n/a	FMDI-Ankara	Turkey	ME-SA/PanAsia-2/TER-08
BHU/3/2009	KM921814	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
TAI/189/87*	KY091288	bovine	TRRL	Thailand	SEA
ISA/1/62	AJ303500	n/a	WRLFMD	Indonesia	ISA-1

*, not a WRLFMD Reference Number

n/a, not available