

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

Genotyping Report v2

FMDV serotype: Asia1
Country: Pakistan
Year: 2022
Batch: WRLFMD/2023/000071
No. of sequences: 12
Report date: 29th September 2023
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/11/2022
Sender reference:	NVL-26
Location of origin:	Islamabad Capital Territory
Country of origin:	Pakistan
Date of collection:	02/03/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	31/08/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54143, genome 54325, sequence viba_54326, sequencing info 54327

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54323	PAK/39/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50297	PAK/47/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50305	PAK/49/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50289	PAK/42/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50293	PAK/45/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50285	PAK/39/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50265	PAK/31/2021	cattle	99.5	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	93.0	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.2	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.6	0	Asia I	ASIA		
viba_385	IND/762/2003	bovine	85.2	0	Asia I	ASIA	G-III	
viba_737	IND/18/80	bovine	85.0	0	Asia I	ASIA	G-V	
viba_161	IND/14/95	bovine	84.6	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.6	0	Asia I	ASIA	G-VIb	
viba_551	YNBS/CHA/58	bovine	84.4	0	Asia I	ASIA		
viba_297	IND/63/72		84.1	0	Asia I	ASIA		

Virus sample name:	PAK/13/2022
Sender reference:	NVL-35
Location of origin:	Attock, Punjab Province
Country of origin:	Pakistan
Date of collection:	07/03/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	31/08/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54163, genome 54292, sequence viba_54293, sequencing info 54294	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54296	PAK/14/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	99.4	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50297	PAK/47/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50305	PAK/49/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50289	PAK/42/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50293	PAK/45/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_54326	PAK/11/2022	cattle	99.2	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.5	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.0	0	Asia I	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	85.9	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.3	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.9	0	Asia I	ASIA	G-V	
viba_385	IND/762/2003	bovine	84.6	0	Asia I	ASIA	G-III	
viba_161	IND/14/95	bovine	84.3	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	
viba_551	YNBS/CHA/58	bovine	84.1	0	Asia I	ASIA		
viba_297	IND/63/72		83.6	0	Asia I	ASIA		

Virus sample name:	PAK/14/2022
Sender reference:	NVL-36
Location of origin:	Attock, Punjab Province
Country of origin:	Pakistan
Date of collection:	07/03/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	31/08/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54167, genome 54295, sequence viba_54296, sequencing info 54297	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54293	PAK/13/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	99.4	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50297	PAK/47/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50305	PAK/49/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50289	PAK/42/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_50293	PAK/45/2021	cattle	99.2	0	Asia I	ASIA	Sindh-08	
viba_54326	PAK/11/2022	cattle	99.2	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.5	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.0	0	Asia I	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	85.9	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.3	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.9	0	Asia I	ASIA	G-V	
viba_385	IND/762/2003	bovine	84.6	0	Asia I	ASIA	G-III	
viba_161	IND/14/95	bovine	84.3	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	
viba_551	YNBS/CHA/58	bovine	84.1	0	Asia I	ASIA		
viba_297	IND/63/72		83.6	0	Asia I	ASIA		

Virus sample name:	PAK/26/2022
Sender reference:	NVL-28
Location of origin:	Mian Wali, Punjab Province
Country of origin:	Pakistan
Date of collection:	17/05/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	01/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54171, genome 54298, sequence viba_54299, sequencing info 54300	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54296	PAK/14/2022	cattle	98.6	0	Asia I	ASIA	Sindh-08	
viba_54293	PAK/13/2022	cattle	98.6	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.2	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_50297	PAK/47/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_50305	PAK/49/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_50289	PAK/42/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	
viba_50293	PAK/45/2021	cattle	98.1	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.3	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	89.8	0	Asia I	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_385	IND/762/2003	bovine	85.4	0	Asia I	ASIA	G-III	
viba_146	Shamir/ISR/89	bovine	85.1	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.9	0	Asia I	ASIA	G-V	
viba_551	YNBS/CHA/58	bovine	84.2	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.1	0	Asia I	ASIA	G-VIb	
viba_297	IND/63/72		84.0	0	Asia I	ASIA		
viba_646	HKN/19/74	bovine	83.8	0	Asia I	ASIA		

Virus sample name:	PAK/28/2022
Sender reference:	NVL-46
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	01/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	01/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54175, genome 54301, sequence viba_54302, sequencing info 54303	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54311	PAK/33/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/29/2022
Sender reference:	NVL-47
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	01/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	01/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54179, genome 54304, sequence viba_54305, sequencing info 54306

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54311	PAK/33/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/31/2022
Sender reference:	NVL-41
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	12/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	05/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54183, genome 54307, sequence viba_54308, sequencing info 54309	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54311	PAK/33/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/33/2022
Sender reference:	NVL-43
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	13/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK2
Harvest date of material:	08/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54187, genome 54310, sequence viba_54311, sequencing info 54312	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/34/2022
Sender reference:	NVL-44
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	13/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	05/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54191, genome 54313, sequence viba_54314, sequencing info 54315

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54311	PAK/33/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/35/2022
Sender reference:	NVL-45
Location of origin:	Karachi, Sindh Province
Country of origin:	Pakistan
Date of collection:	14/10/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	06/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54195, genome 54316, sequence viba_54317, sequencing info 54318	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54311	PAK/33/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_54320	PAK/37/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.9	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.7	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_385	IND/762/2003	bovine	85.7	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.7	0	Asia I	ASIA		
viba_161	IND/14/95	bovine	84.7	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.7	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.7	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.4	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/37/2022
Sender reference:	NVL-50
Location of origin:	Malir, Sindh Province
Country of origin:	Pakistan
Date of collection:	10/11/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK2
Harvest date of material:	08/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54199, genome 54319, sequence viba_54320, sequencing info 54321	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54305	PAK/29/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_54311	PAK/33/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_54317	PAK/35/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_54314	PAK/34/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_54302	PAK/28/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_54308	PAK/31/2022	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	98.7	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	98.6	0	Asia I	ASIA	Sindh-08	
viba_54323	PAK/39/2022	cattle	98.6	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	98.6	0	Asia I	ASIA	Sindh-08	

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_206	PAK/8/2008	water buffalo	92.5	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.0	0	Asia I	ASIA	G- I	
viba_146	Shamir/ISR/89	bovine	85.6	0	Asia I	ASIA		
viba_385	IND/762/2003	bovine	85.5	0	Asia I	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.5	0	Asia I	ASIA	G-VIII	
viba_161	IND/14/95	bovine	84.6	0	Asia I	ASIA		
viba_551	YNBS/CHA/58	bovine	84.6	0	Asia I	ASIA		
viba_737	IND/18/80	bovine	84.6	0	Asia I	ASIA	G-V	
viba_297	IND/63/72		84.2	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.1	0	Asia I	ASIA	G-VIb	

Virus sample name:	PAK/39/2022
Sender reference:	NVL-30
Location of origin:	Rawalpindi, Punjab Province
Country of origin:	Pakistan
Date of collection:	22/11/2022
Host species:	cattle
Serotype:	Asia I
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	05/09/2023
Primers:	As1-1C530F & As1-1C613F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54203, genome 54322, sequence viba_54323, sequencing info 54324

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54326	PAK/11/2022	cattle	100.0	0	Asia I	ASIA	Sindh-08	
viba_50277	PAK/37/2021	cattle	99.8	0	Asia I	ASIA	Sindh-08	
viba_50309	PAK/50/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50281	PAK/38/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50297	PAK/47/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50305	PAK/49/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50289	PAK/42/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50293	PAK/45/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50285	PAK/39/2021	cattle	99.7	0	Asia I	ASIA	Sindh-08	
viba_50265	PAK/31/2021	cattle	99.5	0	Asia I	ASIA	Sindh-08	

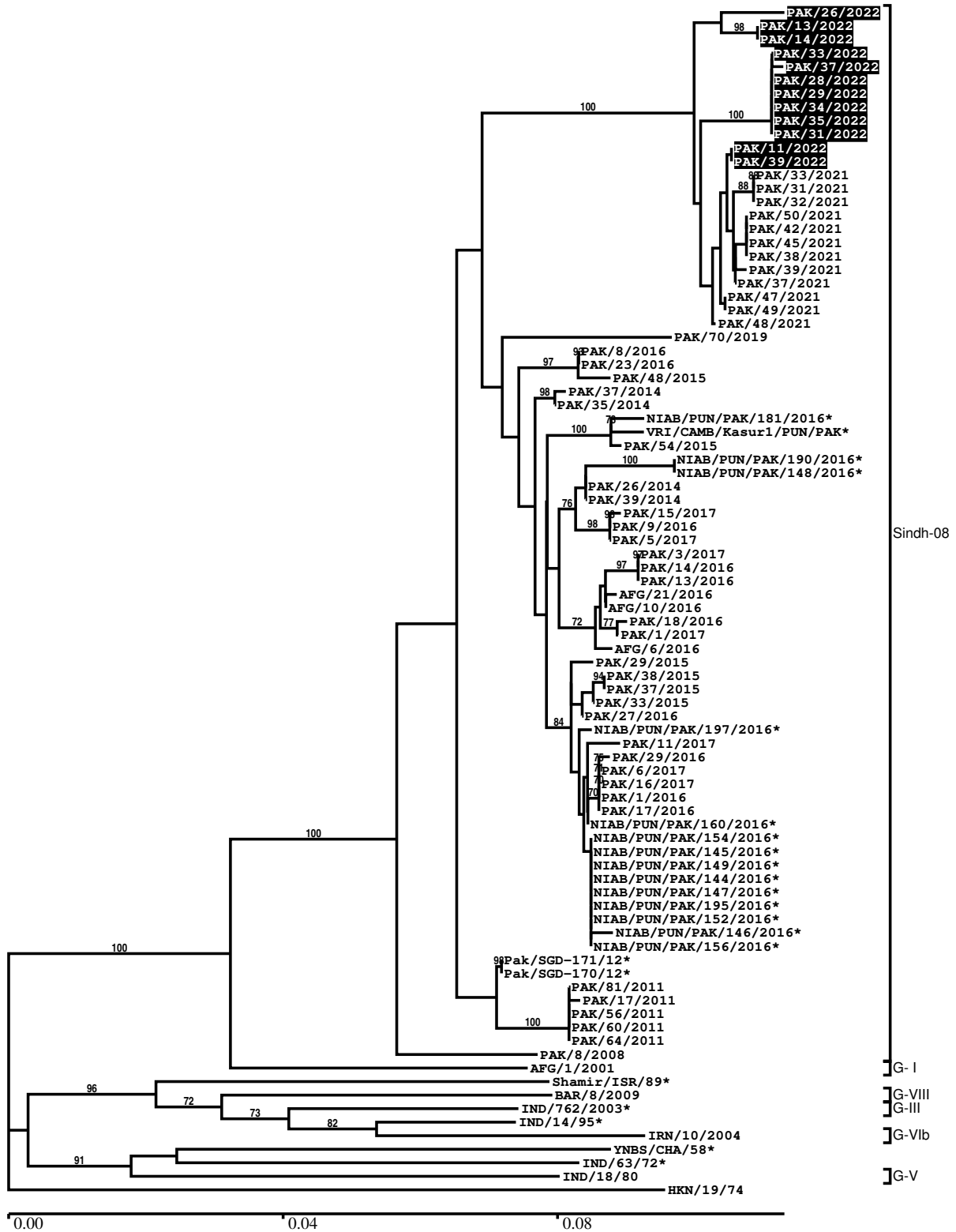
Most Closely Related Prototype Sequences

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

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.0	0	Asia I	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.1	0	Asia I	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.2	0	Asia I	ASIA	G-VIII	
viba_146	Shamir/ISR/89	bovine	85.6	0	Asia I	ASIA		
viba_385	IND/762/2003	bovine	85.2	0	Asia I	ASIA	G-III	
viba_737	IND/18/80	bovine	85.0	0	Asia I	ASIA	G-V	
viba_161	IND/14/95	bovine	84.6	0	Asia I	ASIA		
viba_775	IRN/10/2004	cattle	84.6	0	Asia I	ASIA	G-VIb	
viba_551	YNBS/CHA/58	bovine	84.4	0	Asia I	ASIA		
viba_297	IND/63/72		84.1	0	Asia I	ASIA		

Report on FMDV Asia1 in Pakistan in 2022

Batch: WRLFMD/2023/000071



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_Asia1
Query sequence set:	WRLFMD/2023/000071-Pakistan-Asia1 (12 sequences)
Sequence database set:	allseqs_Asia1 (732 sequences)
Prototype sequence set:	!prototypes_Asia1 (13 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	627
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:	11
VIBASys version:	reflabs-1.1.2

Sequences in the Phylogenetic Tree

All sequences in the tree are in taxonomic group FMDV/Asia1/ASIA

label	accession	host(s)	lab	country	taxonomic information
PAK/26/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/13/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/14/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/37/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/28/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/29/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/34/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/35/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/31/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/11/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/39/2022	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/31/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/32/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/50/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/42/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/45/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/38/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/39/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/37/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/47/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/49/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/48/2021	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/70/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/8/2016	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/23/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/48/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/37/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/35/2014	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/181/2016*	MF140441	cattle	NIAB	Pakistan	Sindh-08
VRI/CAMB/Kasur1/PUN/PAK*	MK241888	cattle	VRI-CAMB	Pakistan	Sindh-08
PAK/54/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/190/2016*	MF140438	water buffalo	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/148/2016*	MF115988	cattle	NIAB	Pakistan	Sindh-08
PAK/26/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08

continued on next page

label	accession	host(s)	lab	country	taxonomic information
PAK/39/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/15/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/9/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/5/2017	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/3/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/14/2016	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/13/2016	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
AFG/21/2016	n/a	bovine	WRLFMD	Afghanistan	Sindh-08
AFG/10/2016	n/a	bovine	WRLFMD	Afghanistan	Sindh-08
PAK/18/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/1/2017	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
AFG/6/2016	n/a	bovine	WRLFMD	Afghanistan	Sindh-08
PAK/29/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/38/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/37/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/27/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/197/2016*	MF167435	dromedary	NIAB	Pakistan	Sindh-08
PAK/11/2017	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/29/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/6/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/16/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/1/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/17/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/160/2016*	MF140439	water buffalo	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/154/2016*	KY659575	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/145/2016*	KY659571	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/149/2016*	KY659574	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/144/2016*	KY659570	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/147/2016*	KY659573	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/195/2016*	MF140443	dromedary	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/152/2016*	MF115989	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/146/2016*	KY659572	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/156/2016*	MF115991	cattle	NIAB	Pakistan	Sindh-08
Pak/SGD-171/12*	KU365820	cattle	PIADC	Pakistan	Sindh-08
Pak/SGD-170/12*	KU365819	cattle	PIADC	Pakistan	Sindh-08
PAK/81/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/17/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/56/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/60/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/64/2011	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/8/2008	KY091304	water buffalo	WRLFMD	Pakistan	Sindh-08
AFG/1/2001	DQ121109	bovine	WRLFMD	Afghanistan	G- I
Shamir/ISR/89*	n/a	bovine	BFAV	Israel	
BAR/8/2009	MG603264	cattle	WRLFMD	Bahrain	G-VIII
IND/762/2003*	DQ101240	bovine	PD-FMD	India	G-III
IND/14/95*	AF390678	bovine	PD-FMD	India	
IRN/10/2004	DQ121119	cattle	WRLFMD	Iran	G-VIb
YNBS/CHA/58*	AY390432	bovine	LVRI	China	
IND/63/72*	AY304994	n/a	IVRI- Bangalore	India	
IND/18/80	DQ121116	bovine	WRLFMD	India	G-V
HKN/19/74	n/a	bovine	WRLFMD	Hong Kong SAR	

*, not a WRLFMD Reference Number
n/a, not available