

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

Genotyping Report

FMDV serotype: A
Country: Pakistan
Year: 2022, 2023
Batch: WRLFMD/2023/000071
No. of sequences: 6
Report date: 28th 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/41/2022a
Sender reference:	NVL-31
Location of origin:	Attock, Punjab Province
Country of origin:	Pakistan
Date of collection:	26/11/2022
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	06/09/2023
Primers:	A-1C562F & A-1C612F/EUR-2B52R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54099, genome 54100, sequence viba_54101, sequencing info 54102

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_50257	PAK/29/2021	cattle	98.3	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	98.3	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	98.3	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	98.3	0	A	ASIA	Iran-05	FAR-11
viba_54097	PAK/27/2022	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_54113	PAK/5/2023	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_54105	PAK/41/2022b	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54117	PAK/6/2023	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54109	PAK/4/2023	cattle	97.6	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	92.9	0	A	ASIA	Iran-05	FAR-11
viba_414	AFG/6/2007	bovine	91.9	0	A	ASIA	Iran-05	AFG-07
viba_34671	BAL/PAK/05/2011	cattle	91.8	0	A	ASIA	Iran-05	BAL-11
viba_13615	IRN/134/2010	cattle	91.7	0	A	ASIA	Iran-05	HER-10
viba_10508	PAK/7/2008	water buffalo	91.6	0	A	ASIA	Iran-05	SIN-08
viba_557	IRN/15/2012	bovine	91.6	0	A	ASIA	Iran-05	SIS-12
viba_319	BAR/6/2008	bovine	91.6	0	A	ASIA	Iran-05	BAR-08
viba_403	TUR/1/2008	cattle	91.5	0	A	ASIA	Iran-05	ARD-07
viba_133	IRN/1/2005	cattle	91.5	0	A	ASIA	Iran-05	
viba_636	IRN/78/2009		91.0	0	A	ASIA	Iran-05	FAR-09

Virus sample name:	PAK/41/2022b
Sender reference:	NVL-31
Location of origin:	Attock, Punjab Province
Country of origin:	Pakistan
Date of collection:	26/11/2022
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	06/09/2023
Primers:	FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54103, genome 54104, sequence viba_54105, sequencing info 54106	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54117	PAK/6/2023	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54109	PAK/4/2023	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54097	PAK/27/2022	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_54113	PAK/5/2023	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_50257	PAK/29/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_54101	PAK/41/2022a	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	96.8	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	93.0	0	A	ASIA	Iran-05	FAR-11
viba_13615	IRN/134/2010	cattle	91.5	0	A	ASIA	Iran-05	HER-10
viba_414	AFG/6/2007	bovine	91.2	0	A	ASIA	Iran-05	AFG-07
viba_557	IRN/15/2012	bovine	91.2	0	A	ASIA	Iran-05	SIS-12
viba_403	TUR/1/2008	cattle	91.0	0	A	ASIA	Iran-05	ARD-07
viba_10508	PAK/7/2008	water buffalo	90.8	0	A	ASIA	Iran-05	SIN-08
viba_319	BAR/6/2008	bovine	90.8	0	A	ASIA	Iran-05	BAR-08
viba_636	IRN/78/2009		90.5	0	A	ASIA	Iran-05	FAR-09
viba_133	IRN/1/2005	cattle	90.4	0	A	ASIA	Iran-05	
viba_34671	BAL/PAK/05/2011	cattle	90.4	0	A	ASIA	Iran-05	BAL-11

Virus sample name:	PAK/27/2022
Sender reference:	NVL-24
Location of origin:	Islamabad Capital Territory
Country of origin:	Pakistan
Date of collection:	23/08/2022
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK2
Harvest date of material:	05/09/2023
Primers:	A-1C562F & A-1C612F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54095, genome 54096, sequence viba_54097, sequencing info 54098	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54113	PAK/5/2023	cattle	99.5	0	A	ASIA	Iran-05	FAR-11
viba_54105	PAK/41/2022b	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_54117	PAK/6/2023	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_54109	PAK/4/2023	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_50257	PAK/29/2021	cattle	98.1	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	98.1	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	98.1	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	98.1	0	A	ASIA	Iran-05	FAR-11
viba_54101	PAK/41/2022a	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	96.8	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	93.4	0	A	ASIA	Iran-05	FAR-11
viba_414	AFG/6/2007	bovine	91.5	0	A	ASIA	Iran-05	AFG-07
viba_13615	IRN/134/2010	cattle	91.5	0	A	ASIA	Iran-05	HER-10
viba_557	IRN/15/2012	bovine	91.5	0	A	ASIA	Iran-05	SIS-12
viba_403	TUR/1/2008	cattle	91.3	0	A	ASIA	Iran-05	ARD-07
viba_10508	PAK/7/2008	water buffalo	91.2	0	A	ASIA	Iran-05	SIN-08
viba_319	BAR/6/2008	bovine	91.2	0	A	ASIA	Iran-05	BAR-08
viba_636	IRN/78/2009		90.8	0	A	ASIA	Iran-05	FAR-09
viba_133	IRN/1/2005	cattle	90.7	0	A	ASIA	Iran-05	
viba_34671	BAL/PAK/05/2011	cattle	90.7	0	A	ASIA	Iran-05	BAL-11

Virus sample name:	PAK/4/2023
Sender reference:	NVL-32
Location of origin:	Attock, Punjab Province
Country of origin:	Pakistan
Date of collection:	01/02/2023
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	06/09/2023
Primers:	A-1C562F & A-1C612F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023

VIBASys IDs: sample 54107, genome 54108, sequence viba_54109, sequencing info 54110

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54105	PAK/41/2022b	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54117	PAK/6/2023	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54097	PAK/27/2022	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_54113	PAK/5/2023	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_50257	PAK/29/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_54101	PAK/41/2022a	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	96.8	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	93.0	0	A	ASIA	Iran-05	FAR-11
viba_13615	IRN/134/2010	cattle	91.5	0	A	ASIA	Iran-05	HER-10
viba_414	AFG/6/2007	bovine	91.2	0	A	ASIA	Iran-05	AFG-07
viba_557	IRN/15/2012	bovine	91.2	0	A	ASIA	Iran-05	SIS-12
viba_403	TUR/1/2008	cattle	91.0	0	A	ASIA	Iran-05	ARD-07
viba_10508	PAK/7/2008	water buffalo	90.8	0	A	ASIA	Iran-05	SIN-08
viba_319	BAR/6/2008	bovine	90.8	0	A	ASIA	Iran-05	BAR-08
viba_636	IRN/78/2009		90.5	0	A	ASIA	Iran-05	FAR-09
viba_133	IRN/1/2005	cattle	90.4	0	A	ASIA	Iran-05	
viba_34671	BAL/PAK/05/2011	cattle	90.4	0	A	ASIA	Iran-05	BAL-11

Virus sample name:	PAK/5/2023
Sender reference:	NVL-33
Location of origin:	Rawalpindi, Punjab Province
Country of origin:	Pakistan
Date of collection:	07/02/2023
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	06/09/2023
Primers:	A-1C562F & A-1C612F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54111, genome 54112, sequence viba_54113, sequencing info 54114	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54097	PAK/27/2022	cattle	99.5	0	A	ASIA	Iran-05	FAR-11
viba_54105	PAK/41/2022b	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_54117	PAK/6/2023	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_54109	PAK/4/2023	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_50257	PAK/29/2021	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	97.9	0	A	ASIA	Iran-05	FAR-11
viba_54101	PAK/41/2022a	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	96.7	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	93.5	0	A	ASIA	Iran-05	FAR-11
viba_13615	IRN/134/2010	cattle	92.0	0	A	ASIA	Iran-05	HER-10
viba_557	IRN/15/2012	bovine	91.9	0	A	ASIA	Iran-05	SIS-12
viba_414	AFG/6/2007	bovine	91.6	0	A	ASIA	Iran-05	AFG-07
viba_403	TUR/1/2008	cattle	91.5	0	A	ASIA	Iran-05	ARD-07
viba_10508	PAK/7/2008	water buffalo	91.3	0	A	ASIA	Iran-05	SIN-08
viba_133	IRN/1/2005	cattle	91.2	0	A	ASIA	Iran-05	
viba_636	IRN/78/2009		91.0	0	A	ASIA	Iran-05	FAR-09
viba_34487	SAR/AFG/L1435/2009	cattle	91.0	0	A	ASIA	Iran-05	SAR-09
viba_319	BAR/6/2008	bovine	91.0	0	A	ASIA	Iran-05	BAR-08

Virus sample name:	PAK/6/2023
Sender reference:	NVL-34
Location of origin:	Rawalpindi, Punjab Province
Country of origin:	Pakistan
Date of collection:	07/02/2023
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	WRL-LFBK1
Harvest date of material:	07/09/2023
Primers:	A-1C562F & A-1C612F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	18/09/2023
Created:	27/09/2023
Last updated:	27/09/2023
VIBASys IDs: sample 54115, genome 54116, sequence viba_54117, sequencing info 54118	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_54105	PAK/41/2022b	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54109	PAK/4/2023	cattle	100.0	0	A	ASIA	Iran-05	FAR-11
viba_54097	PAK/27/2022	cattle	99.4	0	A	ASIA	Iran-05	FAR-11
viba_54113	PAK/5/2023	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_50257	PAK/29/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50253	PAK/28/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50261	PAK/30/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_50249	PAK/22/2021	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_54101	PAK/41/2022a	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_54281	Otarod_02549/IRN/2023	cattle	96.8	0	A	ASIA	Iran-05	FAR-11

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_594	IRN/1/2011	bovine	93.0	0	A	ASIA	Iran-05	FAR-11
viba_13615	IRN/134/2010	cattle	91.5	0	A	ASIA	Iran-05	HER-10
viba_414	AFG/6/2007	bovine	91.2	0	A	ASIA	Iran-05	AFG-07
viba_557	IRN/15/2012	bovine	91.2	0	A	ASIA	Iran-05	SIS-12
viba_403	TUR/1/2008	cattle	91.0	0	A	ASIA	Iran-05	ARD-07
viba_10508	PAK/7/2008	water buffalo	90.8	0	A	ASIA	Iran-05	SIN-08
viba_319	BAR/6/2008	bovine	90.8	0	A	ASIA	Iran-05	BAR-08
viba_636	IRN/78/2009		90.5	0	A	ASIA	Iran-05	FAR-09
viba_133	IRN/1/2005	cattle	90.4	0	A	ASIA	Iran-05	
viba_34671	BAL/PAK/05/2011	cattle	90.4	0	A	ASIA	Iran-05	BAL-11

Report on FMDV A in Pakistan in 2022, 2023

Batch: WRLFMD/2023/000071



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLFMD/2023/000071-Pakistan-A (6 sequences)
Sequence database set:	allseqs_A (2402 sequences)
Prototype sequence set:	!prototypes_A (40 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	633
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/A

label	accession	host(s)	lab	country	taxonomic information
PAK/41/2022b	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/6/2023	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/4/2023	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/27/2022	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/5/2023	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/41/2022a	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/28/2021	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/29/2021	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/30/2021	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/22/2021	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
Otarod_02549/IRN/2023*	OR020836	cattle	UNIV- TEHRAN	Iran	ASIA/Iran-05/FAR-11
AFG/5/2016	n/a	bovine	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
PAK/36/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/50/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/55/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/35/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/31/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/16/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/25/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/10/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/15/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/13/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/20/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/17/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/43/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/41/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/21/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/28/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/12/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/33/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/25/2016	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
Pak/ICT-276/12*	KU258637	bovine	PIADC	Pakistan	ASIA/Iran-05/FAR-11
Pak/KCH-15/12*	KU360079	cattle	PIADC	Pakistan	ASIA/Iran-05/FAR-11
IRN/1/2011	KY091292	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
AFG/8/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11

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label	accession	host(s)	lab	country	taxonomic information
AFG/9/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/13/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/28/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/30/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/32/2013	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
PAK/5/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/17/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/21/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/14/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/22/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/19/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/13/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/11/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/23/2014	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/8/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/25/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/6/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/48/2012	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/1/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
IRN/15/2012	KY091297	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-12
IRN/134/2010	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/HER-10
BAL/PAK/05/2011*	KT832824	cattle	Univ Malakand	Pakistan	ASIA/Iran-05/BAL-11
BAR/6/2008	FJ755010	bovine	WRLFMD	Bahrain	ASIA/Iran-05/BAR-08
SAR/AFG/L1435/2009*	HQ439274	cattle	LINDHOLM	Afghanistan	ASIA/Iran-05/SAR-09
AFG/6/2007	FJ755007	bovine	WRLFMD	Afghanistan	ASIA/Iran-05/AFG-07
TUR/1/2008	FJ755133	cattle	WRLFMD	Turkey	ASIA/Iran-05/ARD-07
IRN/1/2005	EF208769	cattle	WRLFMD	Iran	ASIA/Iran-05
IRN/78/2009	KY091291	n/a	WRLFMD	Iran	ASIA/Iran-05/FAR-09
PAK/7/2008	MN276047	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIN-08
PAK/73/2019	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
Otarod_881/IRN/2019*	OQ682619	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
Otarod_867/IRN/2019*	OQ682621	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
IRN/18/2020	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/18/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
Otarod_8129/IRN/2019*	OQ682625	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
Otarod_8139/IRN/2019*	OQ991935	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
Otarod_8105/IRN/2019*	OQ682624	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
IRN/15/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/99127/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
IRN/991471/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
IRN/99483/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
IRN/99466/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
Otarod_9134/IRN/2020*	OQ991936	cattle	UNIV-TEHRAN	Iran	ASIA/Iran-05/FAR-11
IRN/16/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/8/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/4/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/26/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/6/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/2/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/1/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/12/2020	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/99486/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
IRN/13/2020	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/23/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/9/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/5/2021	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/994883/2020*	n/a	cattle	CVL-IVO	Iran	ASIA/Iran-05/FAR-11
IRN/23/2020	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/20/2020	n/a	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24

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label	accession	host(s)	lab	country	taxonomic information
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III

*, not a WRLFMD Reference Number

n/a, not available