

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

Genotyping Report

FMDV serotype: A
Country: Uganda
Year: 2019
Batch: WRLFMD/2019/00009
No. of sequences: 4
Report date: 7th March 2019
Report generated by: Nick Knowles
Report checked by: Jemma Wadsworth



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

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Virus sample name:	UGA/28/2019
Sender reference:	D1949/01 Kisa
Location of origin:	Kisa
Country of origin:	Uganda
Date of collection:	02/02/2019
Host species:	bovine
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1 23/02/2019 & BTy2
Harvest date of material:	26/02/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	05/03/2019
Created:	07/03/2019
Last updated:	07/03/2019
VIBASys IDs: sample 40483, genome 40484, sequence viba_40485, sequencing info 40486	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_40489	UGA/34/2019	bovine	99.7	0	A	AFRICA	G-I	
viba_40497	UGA/42/2019	bovine	99.5	0	A	AFRICA	G-I	
viba_40493	UGA/35/2019	bovine	99.5	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	94.9	0	A	AFRICA	G-I	
viba_21253	TAN/3/2013	cattle	93.4	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	93.4	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	93.4	0	A	AFRICA	G-I	
viba_19440	TAN/65/2012	cattle	93.4	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	93.4	0	A	AFRICA	G-I	
viba_21291	TAN-CVL-2013-0370	cattle	93.4	0	A	AFRICA	G-I	

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		85.7	0	A	AFRICA	G-I	
viba_785	KEN/3/64		82.0	0	A	AFRICA	G-III	
viba_699	UKG/119/32		81.8	0	A	EURO-SA	A12	
viba_609	GHA/16/73	bovine	81.5	0	A	AFRICA	G-VI	
viba_178	SUD/3/77		80.9	0	A	AFRICA	G-IV	
viba_173	UGA/13/66	bovine	80.6	0	A	AFRICA	G-VII	
viba_557	IRN/15/2012	bovine	80.3	0	A	ASIA	Iran-05	SIS-12
viba_535	NGR/2/73	bovine	80.0	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	79.5	0	A	AFRICA	G-II	
viba_682	IRN/2/87	bovine	79.5	0	A	ASIA	Iran-87	

Virus sample name:	UGA/34/2019
Sender reference:	D1949/03 kiroko
Location of origin:	Kiroko
Country of origin:	Uganda
Date of collection:	02/02/2019
Host species:	bovine
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy2
Harvest date of material:	01/03/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	05/03/2019
Created:	07/03/2019
Last updated:	07/03/2019
VIBASys IDs: sample 40487, genome 40488, sequence viba_40489, sequencing info 40490	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_40497	UGA/42/2019	bovine	99.8	0	A	AFRICA	G-I	
viba_40493	UGA/35/2019	bovine	99.8	0	A	AFRICA	G-I	
viba_40485	UGA/28/2019	bovine	99.7	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.3	0	A	AFRICA	G-I	
viba_21253	TAN/3/2013	cattle	93.7	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	93.7	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	93.7	0	A	AFRICA	G-I	
viba_19440	TAN/65/2012	cattle	93.7	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	93.7	0	A	AFRICA	G-I	
viba_21291	TAN-CVL-2013-0370	cattle	93.7	0	A	AFRICA	G-I	

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		85.9	0	A	AFRICA	G-I	
viba_785	KEN/3/64		82.1	0	A	AFRICA	G-III	
viba_699	UKG/119/32		81.9	0	A	EURO-SA	A12	
viba_609	GHA/16/73	bovine	81.7	0	A	AFRICA	G-VI	
viba_173	UGA/13/66	bovine	80.8	0	A	AFRICA	G-VII	
viba_178	SUD/3/77		80.8	0	A	AFRICA	G-IV	
viba_557	IRN/15/2012	bovine	80.5	0	A	ASIA	Iran-05	SIS-12
viba_535	NGR/2/73	bovine	80.2	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	79.6	0	A	AFRICA	G-II	
viba_682	IRN/2/87	bovine	79.6	0	A	ASIA	Iran-87	

Virus sample name:	UGA/35/2019
Sender reference:	D1949/03 kiroko
Location of origin:	Kiroko
Country of origin:	Uganda
Date of collection:	02/02/2019
Host species:	bovine
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy2
Harvest date of material:	28/02/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	05/03/2019
Created:	07/03/2019
Last updated:	07/03/2019
VIBASys IDs: sample 40491, genome 40492, sequence viba_40493, sequencing info 40494	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_40489	UGA/34/2019	bovine	99.8	0	A	AFRICA	G-I	
viba_40497	UGA/42/2019	bovine	99.7	0	A	AFRICA	G-I	
viba_40485	UGA/28/2019	bovine	99.5	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.1	0	A	AFRICA	G-I	
viba_21253	TAN/3/2013	cattle	93.5	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	93.5	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	93.5	0	A	AFRICA	G-I	
viba_19440	TAN/65/2012	cattle	93.5	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	93.5	0	A	AFRICA	G-I	
viba_21291	TAN-CVL-2013-0370	cattle	93.5	0	A	AFRICA	G-I	

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		85.7	0	A	AFRICA	G-I	
viba_785	KEN/3/64		82.0	0	A	AFRICA	G-III	
viba_699	UKG/119/32		81.8	0	A	EURO-SA	A12	
viba_609	GHA/16/73	bovine	81.5	0	A	AFRICA	G-VI	
viba_173	UGA/13/66	bovine	80.6	0	A	AFRICA	G-VII	
viba_178	SUD/3/77		80.6	0	A	AFRICA	G-IV	
viba_557	IRN/15/2012	bovine	80.3	0	A	ASIA	Iran-05	SIS-12
viba_535	NGR/2/73	bovine	80.0	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	79.5	0	A	AFRICA	G-II	
viba_682	IRN/2/87	bovine	79.5	0	A	ASIA	Iran-87	

Virus sample name:	UGA/42/2019
Sender reference:	D1949/05 Nshama
Location of origin:	Nshama
Country of origin:	Uganda
Date of collection:	02/02/2019
Host species:	bovine
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	23/02/2019
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	05/03/2019
Created:	07/03/2019
Last updated:	07/03/2019
VIBASys IDs: sample 40495, genome 40496, sequence viba_40497, sequencing info 40498	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_40489	UGA/34/2019	bovine	99.8	0	A	AFRICA	G-I	
viba_40493	UGA/35/2019	bovine	99.7	0	A	AFRICA	G-I	
viba_40485	UGA/28/2019	bovine	99.5	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.4	0	A	AFRICA	G-I	
viba_21253	TAN/3/2013	cattle	93.8	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	93.8	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	93.8	0	A	AFRICA	G-I	
viba_19440	TAN/65/2012	cattle	93.8	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	93.8	0	A	AFRICA	G-I	
viba_21291	TAN-CVL-2013-0370	cattle	93.8	0	A	AFRICA	G-I	

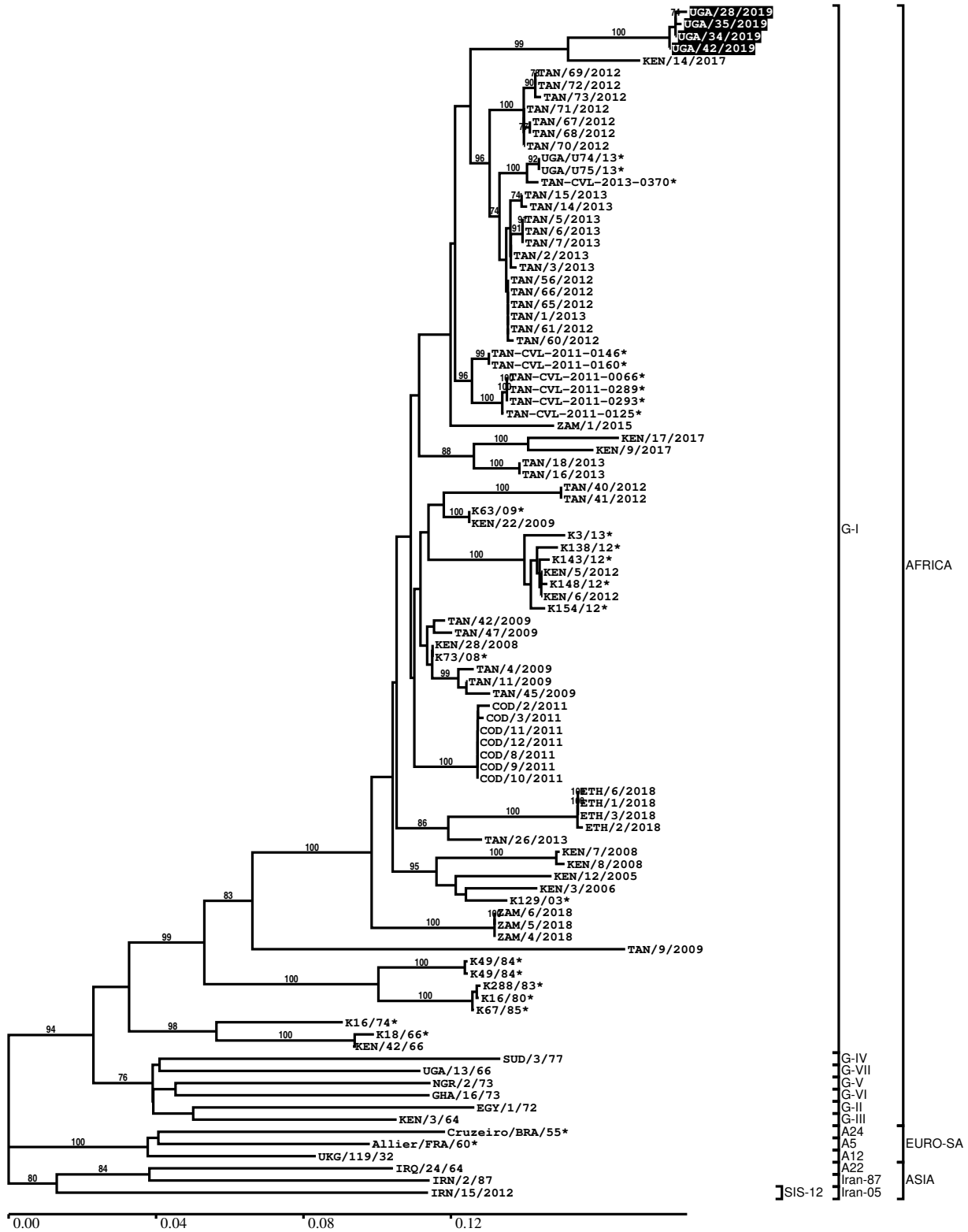
Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_347	KEN/42/66		85.9	0	A	AFRICA	G-I	
viba_785	KEN/3/64		82.1	0	A	AFRICA	G-III	
viba_699	UKG/119/32		81.9	0	A	EURO-SA	A12	
viba_609	GHA/16/73	bovine	81.7	0	A	AFRICA	G-VI	
viba_173	UGA/13/66	bovine	80.8	0	A	AFRICA	G-VII	
viba_178	SUD/3/77		80.8	0	A	AFRICA	G-IV	
viba_557	IRN/15/2012	bovine	80.3	0	A	ASIA	Iran-05	SIS-12
viba_535	NGR/2/73	bovine	80.2	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	79.6	0	A	AFRICA	G-II	
viba_435	Allier/FRA/60		79.4	0	A	EURO-SA	A5	

Report on FMDV A in Uganda in 2019

Batch: WRLFMD/2019/00009



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLFMD/2019/00009-Uganda-A (4 sequences)
Sequence database set:	allseqs_A (1988 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
UGA/28/2019	n/a	bovine	WRLFMD	Uganda	AFRICA/G-I
UGA/35/2019	n/a	bovine	WRLFMD	Uganda	AFRICA/G-I
UGA/34/2019	n/a	bovine	WRLFMD	Uganda	AFRICA/G-I
UGA/42/2019	n/a	bovine	WRLFMD	Uganda	AFRICA/G-I
KEN/14/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
TAN/69/2012	MF592639	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/72/2012	MF592642	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/73/2012	MF592643	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/71/2012	MF592641	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/67/2012	MF592637	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/68/2012	MF592638	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/70/2012	MF592640	cattle	WRLFMD	Tanzania	AFRICA/G-I
UGA/U74/13*	KP089984	bovine	Makerere University	Uganda	AFRICA/G-I
UGA/U75/13*	KP089985	bovine	Makerere University	Uganda	AFRICA/G-I
TAN-CVL-2013-0370*	n/a	cattle	CVL-Tanzania	Tanzania	AFRICA/G-I
TAN/15/2013	MF592652	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/14/2013	MF592651	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/5/2013	MF592648	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/6/2013	n/a	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/7/2013	MF592649	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/2/2013	MF592646	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/3/2013	MF592647	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/56/2012	MF592631	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/66/2012	MF592636	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/65/2012	MF592635	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/1/2013	MF592645	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/61/2012	MF592633	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/60/2012	MF592632	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN-CVL-2011-0146*	n/a	cattle	CVL-Tanzania	Tanzania	AFRICA/G-I
TAN-CVL-2011-0160*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0066*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0289*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0293*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0125*	n/a	bovine	CVL	Tanzania	AFRICA/G-I

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label	accession	host(s)	lab	country	taxonomic information
ZAM/1/2015	n/a	bovine	WRLFMD	Zambia	AFRICA/G-I
KEN/17/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
KEN/9/2017	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
TAN/18/2013	MF592654	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/16/2013	MF592653	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/40/2012	MF592625	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/41/2012	MF592626	cattle	WRLFMD	Tanzania	AFRICA/G-I
K63/09*	KJ440871	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/22/2009	KF561703	cattle	WRLFMD	Kenya	AFRICA/G-I
K3/13*	KJ440876	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K138/12*	KJ440872	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K143/12*	KJ440873	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/5/2012	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
K148/12*	KJ440874	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/6/2012	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
K154/12*	KJ440875	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
TAN/42/2009	KF561695	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/47/2009	KF561697	cattle	WRLFMD	Tanzania	AFRICA/G-I
KEN/28/2008	KF561702	cattle	WRLFMD	Kenya	AFRICA/G-I
K73/08*	KJ440870	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
TAN/4/2009	KF561692	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/11/2009	KF561694	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/45/2009	KF561696	cattle	WRLFMD	Tanzania	AFRICA/G-I
COD/2/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/3/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/11/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/12/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/8/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/9/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
COD/10/2011	n/a	cattle	WRLFMD	Democratic Republic of the Congo	AFRICA/G-I
ETH/6/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/1/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/3/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
ETH/2/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
TAN/26/2013	MF592660	cattle	WRLFMD	Tanzania	AFRICA/G-I
KEN/7/2008	KF561700	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/8/2008	KF561701	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/12/2005	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/3/2006	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
K129/03*	KJ440868	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
ZAM/6/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
ZAM/5/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
ZAM/4/2018	n/a	cattle	WRLFMD	Zambia	AFRICA/G-I
TAN/9/2009	KF561693	cattle	WRLFMD	Tanzania	AFRICA/G-I
K49/84*	n/a	cattle	WRLFMD	Kenya	AFRICA/G-I
K49/84*	KJ440857	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K288/83*	KJ440854	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K16/80*	KJ440847	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K67/85*	KJ440858	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
K16/74*	n/a	n/a	WRLFMD	Kenya	AFRICA/G-I
K18/66*	KJ440839	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/42/66	KF561699	n/a	WRLFMD	Kenya	AFRICA/G-I
SUD/3/77	GU566064	n/a	WRLFMD	Sudan	AFRICA/G-IV

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label	accession	host(s)	lab	country	taxonomic information
UGA/13/66	KF561705	bovine	WRLFMD	Uganda	AFRICA/G-VII
NGR/2/73	KF561704	bovine	WRLFMD	Niger	AFRICA/G-V
GHA/16/73	KF561698	bovine	WRLFMD	Ghana	AFRICA/G-VI
EGY/1/72	EF208756	bovine	WRLFMD	Egypt	AFRICA/G-II
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24
Allier/FRA/60*	AY593780	n/a	PIADC	France	EURO-SA/A5
UKG/119/32	M10975	n/a	PIADC	United Kingdom	EURO-SA/A12
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
IRN/2/87	EF208770	bovine	WRLFMD	Iran	ASIA/Iran-87
IRN/15/2012	KY091297	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-12

*, not a WRLFMD Reference Number

n/a, not available