

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

Genotyping Report

FMDV serotype: A
Country: Uganda
Year: 2016
Batch: WRLMEG/2020/00003
No. of sequences: 4
Report date: 19th January 2020
Report generated by: Nick Knowles
Report checked by: Antonello Di Nardo



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

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Virus sample name:	MOR2-110-P/UGA/2016
Sender reference:	A/MOR2-110-P
Location of origin:	Moroto, Northern Region
Country of origin:	Uganda
Date of collection:	2016
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	18/01/2020
Last updated:	18/01/2020
VIBASys IDs: sample 43039, genome 43040, sequence viba_43041, sequencing info 43042	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_43045	AMD-090-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_43049	AMD-130-P/UGA/2016	cattle	99.4	0	A	AFRICA	G-I	
viba_43053	AMD-134-P/UGA/2016	cattle	99.4	0	A	AFRICA	G-I	
viba_41920	KEN/K91/2015	cattle	98.3	0	A	AFRICA	G-I	
viba_41924	KEN/K103/2015	cattle	98.3	0	A	AFRICA	G-I	
viba_41928	KEN/K74/2016	cattle	97.5	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.9	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	95.4	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	95.4	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	95.4	0	A	AFRICA	G-I	

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_347	KEN/42/66		84.1	0	A	AFRICA	G-I	
viba_609	GHA/16/73	bovine	81.8	0	A	AFRICA	G-VI	
viba_785	KEN/3/64		81.1	0	A	AFRICA	G-III	
viba_173	UGA/13/66	bovine	80.8	0	A	AFRICA	G-VII	
viba_535	NGR/2/73	bovine	79.9	0	A	AFRICA	G-V	
viba_178	SUD/3/77		79.9	0	A	AFRICA	G-IV	
viba_699	UKG/119/32		79.8	0	A	EURO-SA	A12	
viba_557	IRN/15/2012	bovine	79.7	0	A	ASIA	Iran-05	SIS-12
viba_594	IRN/1/2011	bovine	79.3	0	A	ASIA	Iran-05	FAR-11
viba_688	EGY/1/72	bovine	79.2	0	A	AFRICA	G-II	

Virus sample name:	AMD-090-P/UGA/2016
Sender reference:	A/AMD-090-P
Location of origin:	Amudat, Northern Region
Country of origin:	Uganda
Date of collection:	2016
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	18/01/2020
Last updated:	18/01/2020
VIBASys IDs: sample 43043, genome 43044, sequence viba_43045, sequencing info 43046	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_43053	AMD-134-P/UGA/2016	cattle	99.8	0	A	AFRICA	G-I	
viba_43049	AMD-130-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_43041	MOR2-110-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_41920	KEN/K91/2015	cattle	98.4	0	A	AFRICA	G-I	
viba_41924	KEN/K103/2015	cattle	98.4	0	A	AFRICA	G-I	
viba_41928	KEN/K74/2016	cattle	97.6	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	96.1	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	95.6	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	95.6	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	95.6	0	A	AFRICA	G-I	

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_347	KEN/42/66		84.0	0	A	AFRICA	G-I	
viba_609	GHA/16/73	bovine	81.9	0	A	AFRICA	G-VI	
viba_785	KEN/3/64		81.2	0	A	AFRICA	G-III	
viba_173	UGA/13/66	bovine	80.9	0	A	AFRICA	G-VII	
viba_535	NGR/2/73	bovine	80.1	0	A	AFRICA	G-V	
viba_699	UKG/119/32		80.0	0	A	EURO-SA	A12	
viba_178	SUD/3/77		79.9	0	A	AFRICA	G-IV	
viba_557	IRN/15/2012	bovine	79.6	0	A	ASIA	Iran-05	SIS-12
viba_688	EGY/1/72	bovine	79.6	0	A	AFRICA	G-II	
viba_34575	BAD/AFG/L2814/2009	cattle	79.0	0	A	ASIA	Iran-05	BAD-09

Virus sample name:	AMD-130-P/UGA/2016
Sender reference:	A/AMD-130-P
Location of origin:	Amudat, Northern Region
Country of origin:	Uganda
Date of collection:	2016
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	18/01/2020
Last updated:	18/01/2020
VIBASys IDs: sample 43047, genome 43048, sequence viba_43049, sequencing info 43050	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_43045	AMD-090-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_43053	AMD-134-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_43041	MOR2-110-P/UGA/2016	cattle	99.4	0	A	AFRICA	G-I	
viba_41920	KEN/K91/2015	cattle	98.4	0	A	AFRICA	G-I	
viba_41924	KEN/K103/2015	cattle	98.4	0	A	AFRICA	G-I	
viba_41928	KEN/K74/2016	cattle	97.9	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.9	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	95.6	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	95.6	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	95.6	0	A	AFRICA	G-I	

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_347	KEN/42/66		83.8	0	A	AFRICA	G-I	
viba_609	GHA/16/73	bovine	82.1	0	A	AFRICA	G-VI	
viba_785	KEN/3/64		81.2	0	A	AFRICA	G-III	
viba_173	UGA/13/66	bovine	80.8	0	A	AFRICA	G-VII	
viba_178	SUD/3/77		80.0	0	A	AFRICA	G-IV	
viba_535	NGR/2/73	bovine	79.9	0	A	AFRICA	G-V	
viba_699	UKG/119/32		79.7	0	A	EURO-SA	A12	
viba_688	EGY/1/72	bovine	79.3	0	A	AFRICA	G-II	
viba_557	IRN/15/2012	bovine	79.2	0	A	ASIA	Iran-05	SIS-12
viba_594	IRN/1/2011	bovine	78.9	0	A	ASIA	Iran-05	FAR-11

Virus sample name:	AMD-134-P/UGA/2016
Sender reference:	A/AMD-134-P
Location of origin:	Amudat, Northern Region
Country of origin:	Uganda
Date of collection:	2016
Host species:	cattle
Serotype:	A
Topotype:	AFRICA
Lineage:	G-I
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	18/01/2020
Last updated:	18/01/2020
VIBASys IDs: sample 43051, genome 43052, sequence viba_43053, sequencing info 43054	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_43045	AMD-090-P/UGA/2016	cattle	99.8	0	A	AFRICA	G-I	
viba_43049	AMD-130-P/UGA/2016	cattle	99.5	0	A	AFRICA	G-I	
viba_43041	MOR2-110-P/UGA/2016	cattle	99.4	0	A	AFRICA	G-I	
viba_41920	KEN/K91/2015	cattle	98.6	0	A	AFRICA	G-I	
viba_41924	KEN/K103/2015	cattle	98.6	0	A	AFRICA	G-I	
viba_41928	KEN/K74/2016	cattle	97.8	0	A	AFRICA	G-I	
viba_37389	KEN/14/2017	bovine	95.9	0	A	AFRICA	G-I	
viba_19444	TAN/66/2012	cattle	95.7	0	A	AFRICA	G-I	
viba_19428	TAN/56/2012	cattle	95.7	0	A	AFRICA	G-I	
viba_19436	TAN/61/2012	cattle	95.7	0	A	AFRICA	G-I	

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_347	KEN/42/66		83.8	0	A	AFRICA	G-I	
viba_609	GHA/16/73	bovine	82.1	0	A	AFRICA	G-VI	
viba_785	KEN/3/64		81.4	0	A	AFRICA	G-III	
viba_173	UGA/13/66	bovine	80.8	0	A	AFRICA	G-VII	
viba_178	SUD/3/77		80.0	0	A	AFRICA	G-IV	
viba_535	NGR/2/73	bovine	79.9	0	A	AFRICA	G-V	
viba_688	EGY/1/72	bovine	79.8	0	A	AFRICA	G-II	
viba_699	UKG/119/32		79.8	0	A	EURO-SA	A12	
viba_557	IRN/15/2012	bovine	79.4	0	A	ASIA	Iran-05	SIS-12
viba_843	SAU/16/95		78.9	0	A	ASIA	G-VII	

Report on FMDV A in Uganda in 2016

Batch: WRLMEG/2020/00003



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLMEG/2020/00003-Uganda-A (4 sequences)
Sequence database set:	allseqs_A (2055 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:	12
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
AMD-130-P/UGA/2016*	MH367470	cattle	PIADC	Uganda	AFRICA/G-I
AMD-090-P/UGA/2016*	MH367469	cattle	PIADC	Uganda	AFRICA/G-I
AMD-134-P/UGA/2016*	MH367471	cattle	PIADC	Uganda	AFRICA/G-I
MOR2-110-P/UGA/2016*	MH367468	cattle	PIADC	Uganda	AFRICA/G-I
KEN/K74/2016*	MH882567	cattle	PIADC	Kenya	AFRICA/G-I
KEN/K103/2015*	MH882572	cattle	PIADC	Kenya	AFRICA/G-I
KEN/K91/2015*	MH882568	cattle	PIADC	Kenya	AFRICA/G-I
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/70/2012	MF592640	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/71/2012	MF592641	cattle	WRLFMD	Tanzania	AFRICA/G-I
UGA/U75/13*	KP089985	bovine	Makerere University	Uganda	AFRICA/G-I
UGA/U74/13*	KP089984	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/7/2013	MF592649	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/6/2013	n/a	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/5/2013	MF592648	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/1/2013	MF592645	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/65/2012	MF592635	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/61/2012	MF592633	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/66/2012	MF592636	cattle	WRLFMD	Tanzania	AFRICA/G-I

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label	accession	host(s)	lab	country	taxonomic information
TAN/60/2012	MF592632	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN-CVL-2011-0160*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0146*	n/a	cattle	CVL-Tanzania	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-2011-0066*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
TAN-CVL-2011-0125*	n/a	bovine	CVL	Tanzania	AFRICA/G-I
ZAM/1/2015	n/a	bovine	WRLFMD	Zambia	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
ZAM 37/2018*	n/a	bovine	BVI	Zambia	AFRICA/G-I
ETH/6/2018	n/a	cattle	WRLFMD	Ethiopia	AFRICA/G-I
TAN/26/2013	MF592660	cattle	WRLFMD	Tanzania	AFRICA/G-I
KEN/K103/2014*	MH882571	cattle	PIADC	Kenya	AFRICA/G-I
KEN/K145/2014*	MH882569	cattle	PIADC	Kenya	AFRICA/G-I
KEN/K39/2015*	MH882570	cattle	PIADC	Kenya	AFRICA/G-I
KEN/8/2008	KF561701	cattle	WRLFMD	Kenya	AFRICA/G-I
KEN/7/2008	KF561700	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
TAN/40/2012	MF592625	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/41/2012	MF592626	cattle	WRLFMD	Tanzania	AFRICA/G-I
KEN/22/2009	KF561703	cattle	WRLFMD	Kenya	AFRICA/G-I
K63/09*	KJ440871	cattle	Embakasi/Lindholm	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/6/2012	n/a	bovine	WRLFMD	Kenya	AFRICA/G-I
K148/12*	KJ440874	cattle	Embakasi/Lindholm	Kenya	AFRICA/G-I
KEN/5/2012	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/45/2009	KF561696	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/11/2009	KF561694	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/10/2011	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/9/2011	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
TAN/18/2013	MF592654	cattle	WRLFMD	Tanzania	AFRICA/G-I
TAN/16/2013	MF592653	cattle	WRLFMD	Tanzania	AFRICA/G-I
KEN/9/2017	n/a	bovine	WRLFMD	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
UGA/13/66	KF561705	bovine	WRLFMD	Uganda	AFRICA/G-VII

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label	accession	host(s)	lab	country	taxonomic information
EGY/1/72	EF208756	bovine	WRLFMD	Egypt	AFRICA/G-II
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III
NGR/2/73	KF561704	bovine	WRLFMD	Niger	AFRICA/G-V
GHA/16/73	KF561698	bovine	WRLFMD	Ghana	AFRICA/G-VI
UKG/119/32	M10975	n/a	PIADC	United Kingdom	EURO-SA/A12
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24
SAU/16/95	EU553874	n/a	WRLFMD	Saudi Arabia	ASIA/G-VII
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
IRN/1/2011	KY091292	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
IRN/15/2012	KY091297	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-12
BAD/AFG/L2814/2009*	HQ439296	cattle	LINDHOLM	Afghanistan	ASIA/Iran-05/BAD-09

*, not a WRLFMD Reference Number

n/a, not available