

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

## Genotyping Report

FMDV serotype: O  
Country: Comoros  
Year: 2019  
Batch: WRLMEG/2019/00030  
No. of sequences: 4  
Report date: 19th April 2019  
Report generated by: Nick Knowles  
Report checked by: Don King

This report has been prepared on behalf of the European Union Reference Laboratory (EURL), FAO Reference Centre & OIE Reference Laboratory for Foot-and-Mouth Disease chez Agence nationale de sécurité sanitaire – ANSES, Maisons-Alfort, Île-de-France, France and covers VP1 sequences submitted to the WRLFMD on 19/04/2019.

The report also includes four Tanzanian sequences (2017-2018) kindly provided by Prof. Christopher J. Kasanga (Wellcome Trust Fellow), Molecular Biology and Biotechnology Laboratory, Sokoine University of Agriculture, Tanzania.



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

email: [reporting@pirbright.ac.uk](mailto:reporting@pirbright.ac.uk)

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Virus sample name:	COM/19Z005554/19
Sender reference:	O/COM/19Z005554/19
Location of origin:	Plage derriere marche, Moheli
Country of origin:	Comoros
Date of collection:	23/03/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	epithelium
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	19/04/2019
Last updated:	19/04/2019
VIBASys IDs: sample 41323, genome 41325, sequence viba_41326, sequencing info 41327	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_41330	COM/19Z005555/19	cattle	99.8	0	O	EA-2		
viba_41334	COM/19Z005556/19	cattle	99.7	0	O	EA-2		
viba_41338	COM/19Z005557/19	cattle	99.5	0	O	EA-2		
viba_41350	TAN-SUA-2017-0735	cattle	98.6	0	O	EA-2		
viba_41354	TAN-SUA-2017-0747	cattle	98.6	0	O	EA-2		
viba_41346	TAN-SUA-2017-0625	cattle	95.3	0	O	EA-2		
viba_15538	KEN/150/2010	cattle	94.9	0	O	EA-2		
viba_41358	TAN-SUA-2018-0841	porcine	94.3	0	O	EA-2		
viba_6695	TAN/3/2004	bovine	92.7	0	O	EA-2		
viba_6699	TAN/12/2004	bovine	92.7	0	O	EA-2		

#### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.7	0	O	EA-2		
viba_85	UGA/3/2002		88.6	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.3	0	O	EA-2		
viba_221	MAL/1/98		87.4	0	O	EA-2		
viba_523	K83/79		83.8	0	O	EA-1		
viba_116	SUD/2/86	bovine	83.0	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	82.9	0	O	ME-SA	Ind-2001	c
viba_62	ETH/2/2006	bovine	82.8	0	O	EA-3		
viba_705	KUW/3/97	bovine	82.7	0	O	ME-SA	Ind-2001	a
viba_617	IND/53/79	bovine	82.6	0	O	ME-SA		

Virus sample name:	COM/19Z005555/19
Sender reference:	O/COM/19Z005555/19
Location of origin:	Masanzeni, Moheli
Country of origin:	Comoros
Date of collection:	23/03/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	epithelium
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	19/04/2019
Last updated:	19/04/2019
VIBASys IDs: sample 41328, genome 41329, sequence viba_41330, sequencing info 41331	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_41326	COM/19Z005554/19	cattle	99.8	0	O	EA-2		
viba_41334	COM/19Z005556/19	cattle	99.8	0	O	EA-2		
viba_41338	COM/19Z005557/19	cattle	99.7	0	O	EA-2		
viba_41350	TAN-SUA-2017-0735	cattle	98.7	0	O	EA-2		
viba_41354	TAN-SUA-2017-0747	cattle	98.7	0	O	EA-2		
viba_41346	TAN-SUA-2017-0625	cattle	95.4	0	O	EA-2		
viba_15538	KEN/150/2010	cattle	95.1	0	O	EA-2		
viba_41358	TAN-SUA-2018-0841	porcine	94.5	0	O	EA-2		
viba_6695	TAN/3/2004	bovine	92.9	0	O	EA-2		
viba_6699	TAN/12/2004	bovine	92.9	0	O	EA-2		

### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	92.9	0	O	EA-2		
viba_85	UGA/3/2002		88.8	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.5	0	O	EA-2		
viba_221	MAL/1/98		87.5	0	O	EA-2		
viba_523	K83/79		83.9	0	O	EA-1		
viba_116	SUD/2/86	bovine	83.1	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	83.1	0	O	ME-SA	Ind-2001	c
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		
viba_705	KUW/3/97	bovine	82.9	0	O	ME-SA	Ind-2001	a
viba_617	IND/53/79	bovine	82.8	0	O	ME-SA		

Virus sample name:	COM/19Z005556/19
Sender reference:	O/COM/19Z005556/19
Location of origin:	Masanzeni, Moheli
Country of origin:	Comoros
Date of collection:	23/03/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	epithelium
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	19/04/2019
Last updated:	19/04/2019
VIBASys IDs: sample 41332, genome 41333, sequence viba_41334, sequencing info 41335	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_41338	COM/19Z005557/19	cattle	99.8	0	O	EA-2		
viba_41330	COM/19Z005555/19	cattle	99.8	0	O	EA-2		
viba_41326	COM/19Z005554/19	cattle	99.7	0	O	EA-2		
viba_41350	TAN-SUA-2017-0735	cattle	98.9	0	O	EA-2		
viba_41354	TAN-SUA-2017-0747	cattle	98.9	0	O	EA-2		
viba_41346	TAN-SUA-2017-0625	cattle	95.6	0	O	EA-2		
viba_15538	KEN/150/2010	cattle	95.3	0	O	EA-2		
viba_41358	TAN-SUA-2018-0841	porcine	94.6	0	O	EA-2		
viba_6695	TAN/3/2004	bovine	93.0	0	O	EA-2		
viba_263	TAN/2/2004	bovine	93.0	0	O	EA-2		

### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	93.0	0	O	EA-2		
viba_85	UGA/3/2002		88.6	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.3	0	O	EA-2		
viba_221	MAL/1/98		87.4	0	O	EA-2		
viba_523	K83/79		83.8	0	O	EA-1		
viba_116	SUD/2/86	bovine	83.0	0	O	EA-3		
viba_705	KUW/3/97	bovine	83.0	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	82.9	0	O	ME-SA	Ind-2001	c
viba_62	ETH/2/2006	bovine	82.8	0	O	EA-3		
viba_617	IND/53/79	bovine	82.6	0	O	ME-SA		

Virus sample name:	COM/19Z005557/19
Sender reference:	O/COM/19Z005557/19
Location of origin:	Lycee, Moheli
Country of origin:	Comoros
Date of collection:	23/03/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-2
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	epithelium
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	19/04/2019
Last updated:	19/04/2019
VIBASys IDs: sample 41336, genome 41337, sequence viba_41338, sequencing info 41339	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_41334	COM/19Z005556/19	cattle	99.8	0	O	EA-2		
viba_41330	COM/19Z005555/19	cattle	99.7	0	O	EA-2		
viba_41326	COM/19Z005554/19	cattle	99.5	0	O	EA-2		
viba_41350	TAN-SUA-2017-0735	cattle	99.1	0	O	EA-2		
viba_41354	TAN-SUA-2017-0747	cattle	99.1	0	O	EA-2		
viba_41346	TAN-SUA-2017-0625	cattle	95.7	0	O	EA-2		
viba_15538	KEN/150/2010	cattle	95.4	0	O	EA-2		
viba_41358	TAN-SUA-2018-0841	porcine	94.8	0	O	EA-2		
viba_6695	TAN/3/2004	bovine	93.2	0	O	EA-2		
viba_263	TAN/2/2004	bovine	93.2	0	O	EA-2		

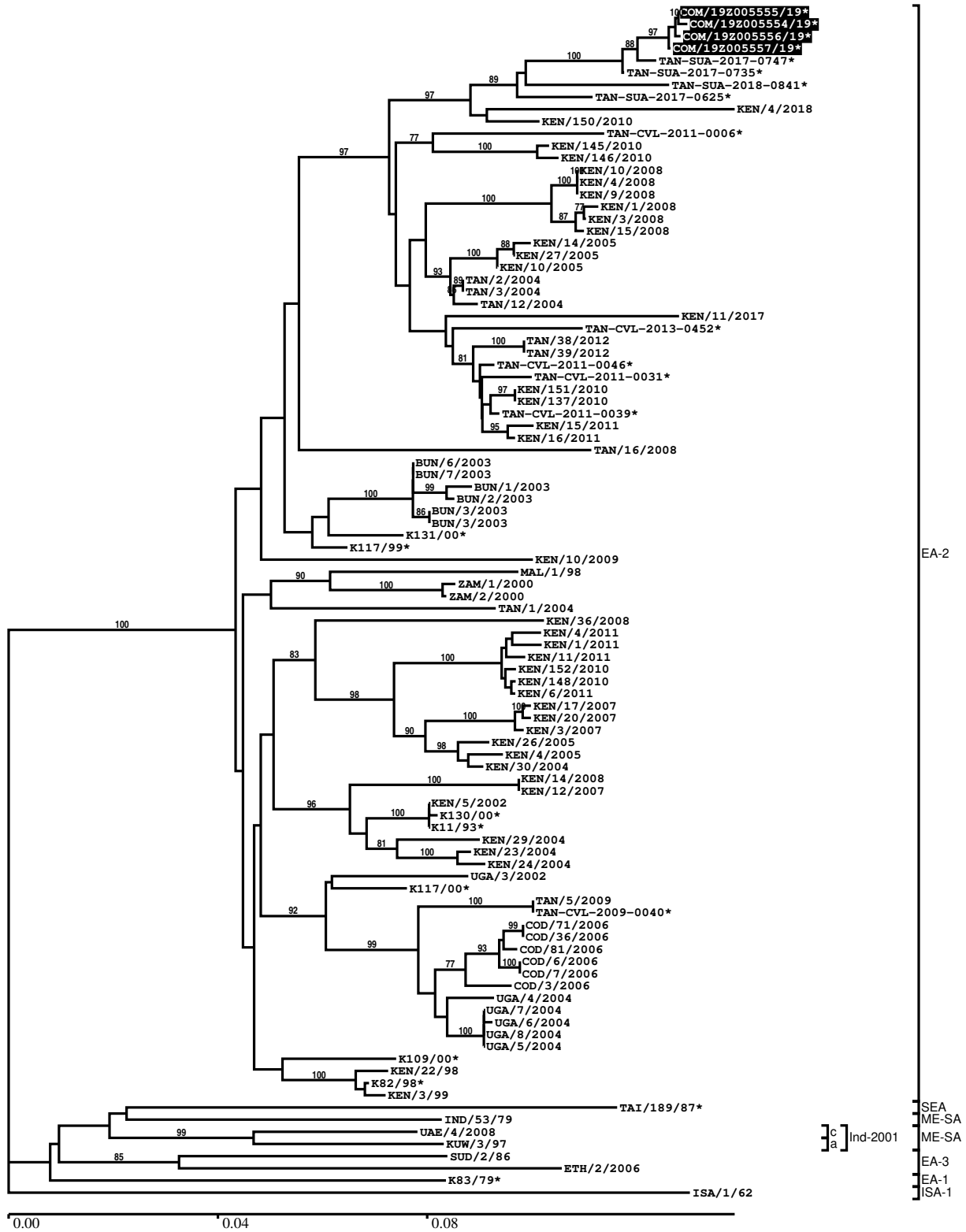
### Most Closely Related Prototype Sequences

see [http://www.wrlfmd.org/fmd\\_genotyping/prototypes.htm](http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_263	TAN/2/2004	bovine	93.2	0	O	EA-2		
viba_85	UGA/3/2002		88.8	0	O	EA-2		
viba_74	KEN/5/2002	bovine	88.5	0	O	EA-2		
viba_221	MAL/1/98		87.5	0	O	EA-2		
viba_523	K83/79		83.9	0	O	EA-1		
viba_705	KUW/3/97	bovine	83.2	0	O	ME-SA	Ind-2001	a
viba_116	SUD/2/86	bovine	83.1	0	O	EA-3		
viba_397	UAE/4/2008	gazelle	83.1	0	O	ME-SA	Ind-2001	c
viba_62	ETH/2/2006	bovine	82.9	0	O	EA-3		
viba_617	IND/53/79	bovine	82.8	0	O	ME-SA		

Report on FMDV O in Comoros in 2019

Batch: WRLMEG/2019/00030



\*, not a WRLFMD Reference Number

## Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLMEG/2019/00030-Comoros-O (4 sequences)
Sequence database set:	allseqs_O (4460 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
COM/19Z005555/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005554/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005556/19*	n/a	cattle	ANSES	Comoros	EA-2
COM/19Z005557/19*	n/a	cattle	ANSES	Comoros	EA-2
TAN-SUA-2017-0747*	n/a	cattle	SUA	Tanzania	EA-2
TAN-SUA-2017-0735*	n/a	cattle	SUA	Tanzania	EA-2
TAN-SUA-2018-0841*	n/a	porcine	SUA	Tanzania	EA-2
TAN-SUA-2017-0625*	n/a	cattle	SUA	Tanzania	EA-2
KEN/4/2018	n/a	bovine	WRLFMD	Kenya	EA-2
KEN/150/2010	KF135286	cattle	WRLFMD	Kenya	EA-2
TAN-CVL-2011-0006*	n/a	bovine	CVL	Tanzania	EA-2
KEN/145/2010	KF135283	cattle	WRLFMD	Kenya	EA-2
KEN/146/2010	KF135284	cattle	WRLFMD	Kenya	EA-2
KEN/10/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/4/2008	KF135277	cattle	WRLFMD	Kenya	EA-2
KEN/9/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/1/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/3/2008	KF135276	cattle	WRLFMD	Kenya	EA-2
KEN/15/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/14/2005	KF135273	cattle	WRLFMD	Kenya	EA-2
KEN/27/2005	KF135274	cattle	WRLFMD	Kenya	EA-2
KEN/10/2005	n/a	cattle	WRLFMD	Kenya	EA-2
TAN/2/2004	KF561679	bovine	WRLFMD	Tanzania	EA-2
TAN/3/2004	KF561680	bovine	WRLFMD	Tanzania	EA-2
TAN/12/2004	KF561681	bovine	WRLFMD	Tanzania	EA-2
KEN/11/2017	n/a	bovine	WRLFMD	Kenya	EA-2
TAN-CVL-2013-0452*	n/a	cattle	CVL, Tanzania	Tanzania	EA-2
TAN/38/2012	MF592623	cattle	WRLFMD	Tanzania	EA-2
TAN/39/2012	MF592624	cattle	WRLFMD	Tanzania	EA-2
TAN-CVL-2011-0046*	n/a	bovine	CVL	Tanzania	EA-2
TAN-CVL-2011-0031*	n/a	cattle	CVL, Tanzania	Tanzania	EA-2
KEN/151/2010	KF135287	cattle	WRLFMD	Kenya	EA-2
KEN/137/2010	KF135282	cattle	WRLFMD	Kenya	EA-2
TAN-CVL-2011-0039*	n/a	bovine	CVL	Tanzania	EA-2
KEN/15/2011	KF135292	cattle	WRLFMD	Kenya	EA-2
KEN/16/2011	KF135293	cattle	WRLFMD	Kenya	EA-2

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label	accession	host(s)	lab	country	taxonomic information
TAN/16/2008	KF561684	cattle	WRLFMD	Tanzania	EA-2
BUN/6/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/7/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/1/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/2/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/3/2003	n/a	n/a	WRLFMD	Burundi	EA-2
BUN/3/2003	n/a	n/a	WRLFMD	Burundi	EA-2
K131/00*	HM756609	bovine	Makerere University	Kenya	EA-2
K117/99*	HM625676	bovine	Makerere University	Kenya	EA-2
KEN/10/2009	KF135280	cattle	WRLFMD	Kenya	EA-2
MAL/1/98	DQ165074	n/a	WRLFMD	Malawi	EA-2
ZAM/1/2000	n/a	bovine	WRLFMD	Zambia	EA-2
ZAM/2/2000	n/a	bovine	WRLFMD	Zambia	EA-2
TAN/1/2004	KF561678	bovine	WRLFMD	Tanzania	EA-2
KEN/36/2008	KF135278	cattle	WRLFMD	Kenya	EA-2
KEN/4/2011	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/1/2011	KF135289	cattle	WRLFMD	Kenya	EA-2
KEN/11/2011	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/152/2010	KF135288	cattle	WRLFMD	Kenya	EA-2
KEN/148/2010	KF135285	cattle	WRLFMD	Kenya	EA-2
KEN/6/2011	KF135291	cattle	WRLFMD	Kenya	EA-2
KEN/17/2007	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/20/2007	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/3/2007	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/26/2005	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/4/2005	KF135272	cattle	WRLFMD	Kenya	EA-2
KEN/30/2004	KF135271	cattle	WRLFMD	Kenya	EA-2
KEN/14/2008	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/12/2007	KF135275	cattle	WRLFMD	Kenya	EA-2
KEN/5/2002	DQ165073	bovine	WRLFMD	Kenya	EA-2
K130/00*	HM756608	bovine	Makerere University	Kenya	EA-2
K11/93*	HM756598	bovine	Makerere University	Kenya	EA-2
KEN/29/2004	KF135270	cattle	WRLFMD	Kenya	EA-2
KEN/23/2004	n/a	cattle	WRLFMD	Kenya	EA-2
KEN/24/2004	KF135269	cattle	WRLFMD	Kenya	EA-2
UGA/3/2002	DQ165077	n/a	WRLFMD	Uganda	EA-2
K117/00*	HM756607	bovine	Makerere University	Kenya	EA-2
TAN/5/2009	KF561685	cattle	WRLFMD	Tanzania	EA-2
TAN-CVL-2009-0040*	n/a	bovine	CVL	Tanzania	EA-2
COD/71/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/36/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/81/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/6/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/7/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
COD/3/2006	n/a	cattle	WRLFMD	Democratic Republic of the Congo	EA-2
UGA/4/2004	n/a	bovine	WRLFMD	Uganda	EA-2
UGA/7/2004	n/a	bovine	WRLFMD	Uganda	EA-2
UGA/6/2004	n/a	bovine	WRLFMD	Uganda	EA-2
UGA/8/2004	n/a	bovine	WRLFMD	Uganda	EA-2
UGA/5/2004	n/a	bovine	WRLFMD	Uganda	EA-2

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label	accession	host(s)	lab	country	taxonomic information
K109/00*	HM756606	bovine	Makerere	Kenya	EA-2
	HM625675		University		
KEN/22/98	n/a	bovine	WRLFMD	Kenya	EA-2
K82/98*	HM756602	bovine	Makerere	Kenya	EA-2
			University		
KEN/3/99	n/a	bovine	WRLFMD	Kenya	EA-2
TAI/189/87*	KY091288	bovine	TRRL	Thailand	SEA
IND/53/79	AF292107	bovine	PD-FMD	India	ME-SA
UAE/4/2008	KM921876	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/c
KUW/3/97	DQ164904	bovine	WRLFMD	Kuwait	ME-SA/Ind-2001/a
SUD/2/86	DQ165075	bovine	WRLFMD	Sudan	EA-3
ETH/2/2006	FJ798127	bovine	WRLFMD	Ethiopia	EA-3
K83/79*	AJ303511	n/a	WRLFMD	Kenya	EA-1
ISA/1/62	AJ303500	n/a	WRLFMD	Indonesia	ISA-1

\*, not a WRLFMD Reference Number

n/a, not available