

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

Genotyping Report

FMDV serotype: O
Country: Morocco
Year: 2019
Batch: WRLFMD/2019/00018
No. of sequences: 4
Report date: 5th April 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:	MOR/1/2019
Sender reference:	O/MOR/19Z001727/2019/190219i
Location of origin:	Khouribga
Country of origin:	Morocco
Date of collection:	15/01/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-3
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	29/03/2019
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	03/04/2019
Created:	05/04/2019
Last updated:	05/04/2019
VIBASys IDs: sample 41170, genome 41171, sequence viba_41172, sequencing info 41173	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_39800	MOR/19Z01727/19	bovine	100.0	0	O	EA-3		
viba_39792	MOR/19Z00948/19	bovine	100.0	0	O	EA-3		
viba_39796	MOR/19Z00949/19	bovine	99.8	0	O	EA-3		
viba_39808	MOR/19Z01729/19	bovine	99.7	0	O	EA-3		
viba_41180	MOR/3/2019	cattle	99.7	0	O	EA-3		
viba_39452	ALG/8/2018	cattle	99.2	0	O	EA-3		
viba_37583	SEN/9/2018	cattle	99.1	0	O	EA-3		
viba_36938	ALG/1/2018	cattle	99.1	0	O	EA-3		
viba_37575	SEN/4/2018	cattle	99.1	0	O	EA-3		
viba_37530	MAU/18Z007128/18		99.1	0	O	EA-3		

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_116	SUD/2/86	bovine	89.0	0	O	EA-3		
viba_854	ETH/1/2007	cattle	85.5	0	O	EA-3		
viba_30238	MUR/19/2016	cattle	85.3	0	O	ME-SA	Ind-2001	e
viba_408	ETH/3/2004	cattle	85.3	0	O	EA-3		
viba_50	UGA/17/98		84.8	0	O	EA-4		
viba_104	GHA/5/93	bovine	84.2	0	O	WA		
viba_523	K83/79		84.2	0	O	EA-1		
viba_285	UKG/35/2001	porcine	84.0	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	83.9	0	O	ME-SA	PanAsia-2	PUN-10
viba_85	UGA/3/2002		83.9	0	O	EA-2		

Virus sample name:	MOR/2/2019
Sender reference:	O/MOR/19Z001728/2019/190319z
Location of origin:	Khouribga
Country of origin:	Morocco
Date of collection:	15/01/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-3
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	29/03/2019
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	03/04/2019
Created:	05/04/2019
Last updated:	05/04/2019
VIBASys IDs: sample 41174, genome 41175, sequence viba_41176, sequencing info 41177	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_39804	MOR/19Z01728/19	bovine	100.0	0	O	EA-3		
viba_41184	MOR/4/2019	cattle	99.5	0	O	EA-3		
viba_39812	MOR/19Z01730/19	bovine	99.5	0	O	EA-3		
viba_41189	TUN/1/2018	cattle	99.1	0	O	EA-3		
viba_40259	TUN/19Z002372/19	bovine	99.1	0	O	EA-3		
viba_40263	TUN/19Z002373/19	bovine	99.1	0	O	EA-3		
viba_37583	SEN/9/2018	cattle	98.9	0	O	EA-3		
viba_36938	ALG/1/2018	cattle	98.9	0	O	EA-3		
viba_37587	SEN/11/2018	cattle	98.9	0	O	EA-3		
viba_37575	SEN/4/2018	cattle	98.9	0	O	EA-3		

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_116	SUD/2/86	bovine	88.5	0	O	EA-3		
viba_408	ETH/3/2004	cattle	85.5	0	O	EA-3		
viba_854	ETH/1/2007	cattle	85.3	0	O	EA-3		
viba_50	UGA/17/98		85.1	0	O	EA-4		
viba_30238	MUR/19/2016	cattle	85.0	0	O	ME-SA	Ind-2001	e
viba_104	GHA/5/93	bovine	83.9	0	O	WA		
viba_285	UKG/35/2001	porcine	83.8	0	O	ME-SA	PanAsia	
viba_199	MYA/7/98	bovine	83.8	0	O	SEA	Mya-98	
viba_85	UGA/3/2002		83.7	0	O	EA-2		
viba_523	K83/79		83.7	0	O	EA-1		

Virus sample name:	MOR/3/2019
Sender reference:	O/MOR/19Z001729/2019/190319z
Location of origin:	Khouribga
Country of origin:	Morocco
Date of collection:	15/01/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-3
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	29/03/2019
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	03/04/2019
Created:	05/04/2019
Last updated:	05/04/2019
VIBASys IDs: sample 41178, genome 41179, sequence viba_41180, sequencing info 41181	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_39808	MOR/19Z01729/19	bovine	100.0	0	O	EA-3		
viba_39800	MOR/19Z01727/19	bovine	99.7	0	O	EA-3		
viba_39792	MOR/19Z00948/19	bovine	99.7	0	O	EA-3		
viba_41172	MOR/1/2019	cattle	99.7	0	O	EA-3		
viba_39796	MOR/19Z00949/19	bovine	99.5	0	O	EA-3		
viba_39452	ALG/8/2018	cattle	98.9	0	O	EA-3		
viba_38387	ALG/19Z000120/18	ovine	98.7	0	O	EA-3		
viba_37583	SEN/9/2018	cattle	98.7	0	O	EA-3		
viba_36938	ALG/1/2018	cattle	98.7	0	O	EA-3		
viba_37575	SEN/4/2018	cattle	98.7	0	O	EA-3		

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_116	SUD/2/86	bovine	89.0	0	O	EA-3		
viba_854	ETH/1/2007	cattle	85.5	0	O	EA-3		
viba_30238	MUR/19/2016	cattle	85.3	0	O	ME-SA	Ind-2001	e
viba_408	ETH/3/2004	cattle	85.3	0	O	EA-3		
viba_50	UGA/17/98		84.8	0	O	EA-4		
viba_104	GHA/5/93	bovine	84.1	0	O	WA		
viba_523	K83/79		84.0	0	O	EA-1		
viba_285	UKG/35/2001	porcine	84.0	0	O	ME-SA	PanAsia	
viba_705	KUW/3/97	bovine	83.9	0	O	ME-SA	Ind-2001	a
viba_576	IND/R2/75		83.9	0	O	ME-SA		

Virus sample name:	MOR/4/2019
Sender reference:	O/MOR/19Z001730/2019/190319z
Location of origin:	Sidi Bennour
Country of origin:	Morocco
Date of collection:	15/01/2019
Host species:	cattle
Serotype:	O
Topotype:	EA-3
Lineage:	
Sublineage:	
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	29/03/2019
Primers:	O-1C244F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	03/04/2019
Created:	05/04/2019
Last updated:	05/04/2019
VIBASys IDs: sample 41182, genome 41183, sequence viba_41184, sequencing info 41185	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_39812	MOR/19Z01730/19	bovine	100.0	0	O	EA-3		
viba_39804	MOR/19Z01728/19	bovine	99.5	0	O	EA-3		
viba_41176	MOR/2/2019	cattle	99.5	0	O	EA-3		
viba_41189	TUN/1/2018	cattle	98.9	0	O	EA-3		
viba_40259	TUN/19Z002372/19	bovine	98.9	0	O	EA-3		
viba_40263	TUN/19Z002373/19	bovine	98.9	0	O	EA-3		
viba_37583	SEN/9/2018	cattle	98.7	0	O	EA-3		
viba_36938	ALG/1/2018	cattle	98.7	0	O	EA-3		
viba_37587	SEN/11/2018	cattle	98.7	0	O	EA-3		
viba_37575	SEN/4/2018	cattle	98.7	0	O	EA-3		

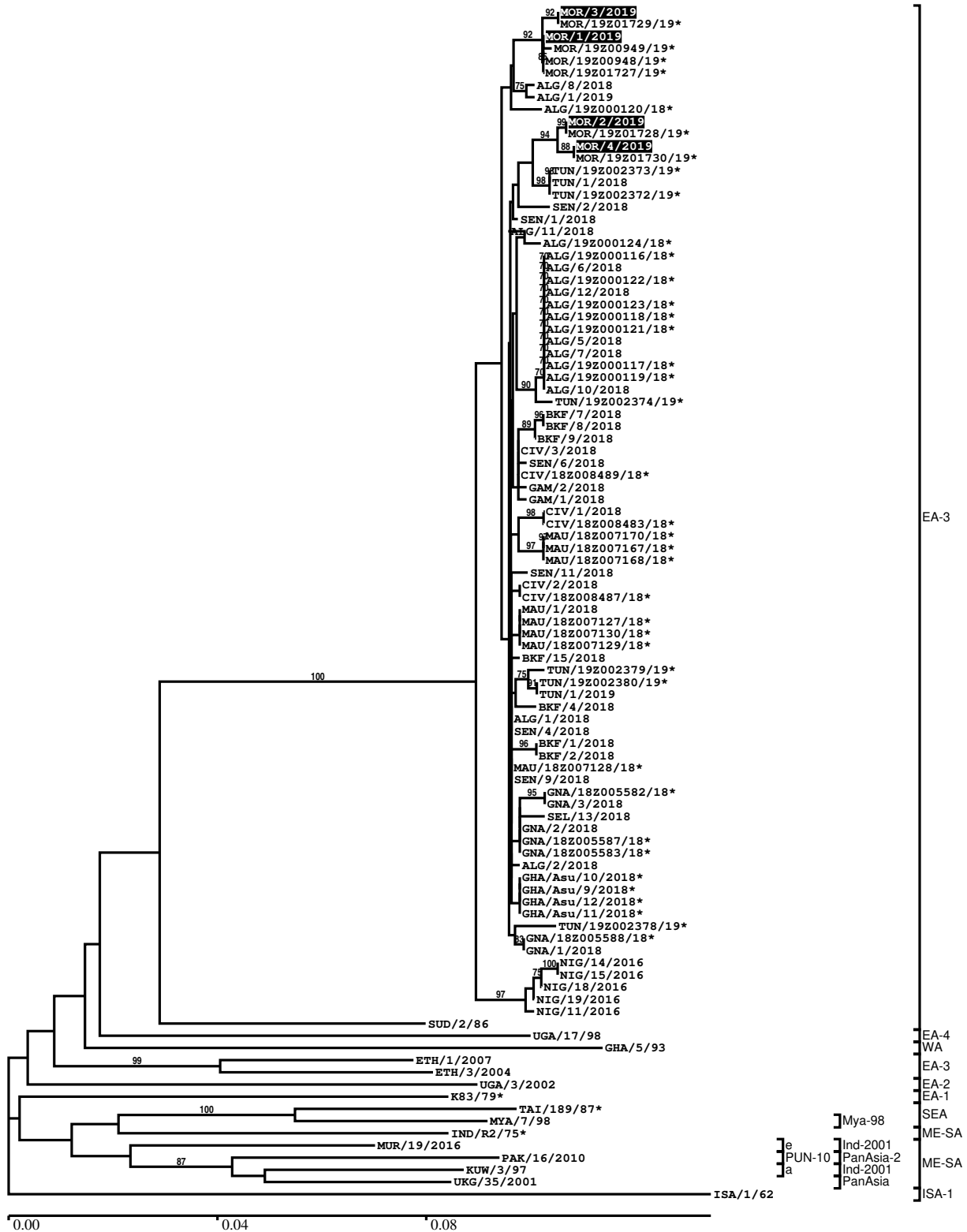
Most Closely Related Prototype Sequences

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

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_116	SUD/2/86	bovine	88.3	0	O	EA-3		
viba_408	ETH/3/2004	cattle	85.5	0	O	EA-3		
viba_854	ETH/1/2007	cattle	85.3	0	O	EA-3		
viba_50	UGA/17/98		85.1	0	O	EA-4		
viba_30238	MUR/19/2016	cattle	85.0	0	O	ME-SA	Ind-2001	e
viba_285	UKG/35/2001	porcine	84.0	0	O	ME-SA	PanAsia	
viba_104	GHA/5/93	bovine	83.6	0	O	WA		
viba_85	UGA/3/2002		83.6	0	O	EA-2		
viba_523	K83/79		83.4	0	O	EA-1		
viba_199	MYA/7/98	bovine	83.4	0	O	SEA	Mya-98	

Report on FMDV O in Morocco in 2019

Batch: WRLFMD/2019/00018



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLFMD/2019/00018-Morocco-O (4 sequences)
Sequence database set:	allseqs_O (4429 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:	13
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
MOR/3/2019	n/a	cattle	WRLFMD	Morocco	EA-3
MOR/19Z01729/19*	n/a	bovine	ANSES	Morocco	EA-3
MOR/1/2019	n/a	cattle	WRLFMD	Morocco	EA-3
MOR/19Z00949/19*	n/a	bovine	ANSES	Morocco	EA-3
MOR/19Z00948/19*	n/a	bovine	ANSES	Morocco	EA-3
MOR/19Z01727/19*	n/a	bovine	ANSES	Morocco	EA-3
ALG/8/2018	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/1/2019	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/19Z000120/18*	n/a	ovine	ANSES	Algeria	EA-3
MOR/2/2019	n/a	cattle	WRLFMD	Morocco	EA-3
MOR/19Z01728/19*	n/a	bovine	ANSES	Morocco	EA-3
MOR/4/2019	n/a	cattle	WRLFMD	Morocco	EA-3
MOR/19Z01730/19*	n/a	bovine	ANSES	Morocco	EA-3
TUN/19Z002373/19*	n/a	bovine	ANSES	Tunisia	EA-3
TUN/1/2018	n/a	cattle	WRLFMD	Tunisia	EA-3
TUN/19Z002372/19*	n/a	bovine	ANSES	Tunisia	EA-3
SEN/2/2018	n/a	porcine	WRLFMD	Senegal	EA-3
SEN/1/2018	n/a	cattle	WRLFMD	Senegal	EA-3
ALG/11/2018	n/a	n/a	WRLFMD	Algeria	EA-3
ALG/19Z000124/18*	n/a	caprine	ANSES	Algeria	EA-3
ALG/19Z000116/18*	n/a	bovine	ANSES	Algeria	EA-3
ALG/6/2018	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/19Z000122/18*	n/a	caprine	ANSES	Algeria	EA-3
ALG/12/2018	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/19Z000123/18*	n/a	caprine	ANSES	Algeria	EA-3
ALG/19Z000118/18*	n/a	bovine	ANSES	Algeria	EA-3
ALG/19Z000121/18*	n/a	caprine	ANSES	Algeria	EA-3
ALG/5/2018	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/7/2018	n/a	cattle	WRLFMD	Algeria	EA-3
ALG/19Z000117/18*	n/a	bovine	ANSES	Algeria	EA-3
ALG/19Z000119/18*	n/a	bovine	ANSES	Algeria	EA-3
ALG/10/2018	n/a	sheep	WRLFMD	Algeria	EA-3
TUN/19Z002374/19*	n/a	bovine	ANSES	Tunisia	EA-3
BKF/7/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
BKF/8/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
BKF/9/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3

continued on next page

label	accession	host(s)	lab	country	taxonomic information
CIV/3/2018	n/a	porcine	WRLFMD	Cote d'Ivoire	EA-3
SEN/6/2018	n/a	cattle	WRLFMD	Senegal	EA-3
CIV/18Z008489/18*	n/a	porcine	ANSES	Cote d'Ivoire	EA-3
GAM/2/2018	n/a	cattle	WRLFMD	Gambia	EA-3
GAM/1/2018	n/a	cattle	WRLFMD	Gambia	EA-3
CIV/1/2018	n/a	porcine	WRLFMD	Cote d'Ivoire	EA-3
CIV/18Z008483/18*	n/a	porcine	ANSES	Cote d'Ivoire	EA-3
MAU/18Z007170/18*	n/a	n/a	ANSES	Mauritania	EA-3
MAU/18Z007167/18*	n/a	n/a	ANSES	Mauritania	EA-3
MAU/18Z007168/18*	n/a	n/a	ANSES	Mauritania	EA-3
SEN/11/2018	n/a	cattle	WRLFMD	Senegal	EA-3
CIV/2/2018	n/a	porcine	WRLFMD	Cote d'Ivoire	EA-3
CIV/18Z008487/18*	n/a	porcine	ANSES	Cote d'Ivoire	EA-3
MAU/1/2018	n/a	cattle	WRLFMD	Mauritania	EA-3
MAU/18Z007127/18*	n/a	n/a	ANSES	Mauritania	EA-3
MAU/18Z007130/18*	n/a	n/a	ANSES	Mauritania	EA-3
MAU/18Z007129/18*	n/a	n/a	ANSES	Mauritania	EA-3
BKF/15/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
TUN/19Z002379/19*	n/a	bovine	ANSES	Tunisia	EA-3
TUN/19Z002380/19*	n/a	bovine	ANSES	Tunisia	EA-3
TUN/1/2019	n/a	cattle	WRLFMD	Tunisia	EA-3
BKF/4/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
ALG/1/2018	n/a	cattle	WRLFMD	Algeria	EA-3
SEN/4/2018	n/a	cattle	WRLFMD	Senegal	EA-3
BKF/1/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
BKF/2/2018	n/a	cattle	WRLFMD	Burkina Faso	EA-3
MAU/18Z007128/18*	n/a	n/a	ANSES	Mauritania	EA-3
SEN/9/2018	n/a	cattle	WRLFMD	Senegal	EA-3
GNA/18Z005582/18*	n/a	n/a	ANSES	Guinea	EA-3
GNA/3/2018	n/a	cattle	WRLFMD	Guinea	EA-3
SEL/13/2018	n/a	cattle	WRLFMD	Sierra Leone	EA-3
GNA/2/2018	n/a	cattle	WRLFMD	Guinea	EA-3
GNA/18Z005587/18*	n/a	n/a	ANSES	Guinea	EA-3
GNA/18Z005583/18*	n/a	n/a	ANSES	Guinea	EA-3
ALG/2/2018	n/a	cattle	WRLFMD	Algeria	EA-3
GHA/Asu/10/2018*	LC456871	cattle	NIAH-JAPAN	Ghana	EA-3
GHA/Asu/9/2018*	LC456870	cattle	NIAH-JAPAN	Ghana	EA-3
GHA/Asu/12/2018*	LC456873	cattle	NIAH-JAPAN	Ghana	EA-3
GHA/Asu/11/2018*	LC456872	cattle	NIAH-JAPAN	Ghana	EA-3
TUN/19Z002378/19*	n/a	bovine	ANSES	Tunisia	EA-3
GNA/18Z005588/18*	n/a	n/a	ANSES	Guinea	EA-3
GNA/1/2018	n/a	cattle	WRLFMD	Guinea	EA-3
NIG/14/2016	n/a	cattle	WRLFMD	Nigeria	EA-3
NIG/15/2016	n/a	cattle	WRLFMD	Nigeria	EA-3
NIG/18/2016	n/a	cattle	WRLFMD	Nigeria	EA-3
NIG/19/2016	n/a	cattle	WRLFMD	Nigeria	EA-3
NIG/11/2016	n/a	cattle	WRLFMD	Nigeria	EA-3
SUD/2/86	DQ165075	bovine	WRLFMD	Sudan	EA-3
UGA/17/98	HM211075	n/a	WRLFMD	Uganda	EA-4
GHA/5/93	AJ303488	bovine	WRLFMD	Ghana	WA
ETH/1/2007	FJ798137	cattle	WRLFMD	Ethiopia	EA-3
ETH/3/2004	FJ798109	cattle	WRLFMD	Ethiopia	EA-3
UGA/3/2002	DQ165077	n/a	WRLFMD	Uganda	EA-2
K83/79*	AJ303511	n/a	WRLFMD	Kenya	EA-1
TAI/189/87*	KY091288	bovine	TRRL	Thailand	SEA
MYA/7/98	DQ164925	bovine	WRLFMD	Myanmar	SEA/Mya-98
IND/R2/75*	AF204276	n/a	PD-FMD	India	ME-SA
MUR/19/2016	MG972510	cattle	WRLFMD	Mauritius	ME-SA/Ind-2001/e
PAK/16/2010	KY091285	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/PUN-10
KUW/3/97	DQ164904	bovine	WRLFMD	Kuwait	ME-SA/Ind-2001/a
UKG/35/2001	AJ539141	porcine	PIADC	United Kingdom	ME-SA/PanAsia
ISA/1/62	AJ303500	n/a	WRLFMD	Indonesia	ISA-1

*, not a WRLFMD Reference Number

n/a, not available