

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

Genotyping Report v.2

FMDV serotype: SAT2
Country: Nigeria
Year: 2019
Batch: WRLMEG/2020/00037
No. of sequences: 2
Report date: 17th December 2020
Report generated by: Nick Knowles
Report checked by: Jemma Wadsworth

This report has been prepared on behalf of the National Centre for Foreign Animal Disease (NCFAD), Canadian Food Inspection Agency (CFIA/ACIA), Winnipeg, Manitoba, Canada and the National Veterinary Research Institute (NVRI), Vom, Nigeria and covers VP1 sequences submitted to the WRLFMD on 25/11/2020.



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Virus sample name:	KB/005/006/NIG/2019/iso
Sender reference:	KB/005/006/19 (ISOLATE)
Location of origin:	Kebbi State
Country of origin:	Nigeria
Date of collection:	18/09/2019
Host species:	bovine
Serotype:	SAT2
Topotype:	VII
Lineage:	
Sublineage:	
Sequence length:	642
Ambiguities:	0
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	01/12/2020
Last updated:	01/12/2020
VIBASys IDs: sample 45698, genome 45699, sequence viba_45700, sequencing info 45701	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20604	NIG/2/2012	bovine	94.9	0	SAT2	VII		
viba_20608	NIG/3/2012	bovine	94.9	0	SAT2	VII		
viba_20600	NIG/1/2012	bovine	94.9	0	SAT2	VII		
viba_40845	Nig/7/12	bovine	93.8	0	SAT2	VII		
viba_40841	Nig/6/12	bovine	93.8	0	SAT2	VII		
viba_40837	Nig/5/12	bovine	93.6	0	SAT2	VII		
viba_40877	Nig/28/12	bovine	93.6	0	SAT2	VII		
viba_40829	Nig/2/12	bovine	93.6	0	SAT2	VII		
viba_18965	NIG/7/2011	bovine	93.6	0	SAT2	VII		
viba_40853	Nig/9/12	bovine	93.6	0	SAT2	VII		

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_742	CAR/8/2005	cattle	88.9	0	SAT2	VII		
viba_424	SAU/6/2000	bovine	88.3	1	SAT2	VII		
viba_374	ZAI/1/74		74.4	0	SAT2	VIII		
viba_189	RWA/1/2000		74.4	0	SAT2	VIII		
viba_470	KEN/2/84	bovine	74.4	0	SAT2	IX		
viba_456	ZAI/1/82	bovine	73.7	1	SAT2	X		
viba_369	UGA/51/75	bovine	73.6	0	SAT2	XII		
viba_139	ETH/2/2007	cattle	73.0	0	SAT2	XIII		
viba_752	SA/106/59		73.0	0	SAT2	I		
viba_193	SUD/6/77		72.9	0	SAT2	XIII		

Virus sample name:	LAG/IBJ/01/NIG/2019
Sender reference:	LAG/IBJ/01/19
Location of origin:	Lagos State
Country of origin:	Nigeria
Date of collection:	28/11/2019
Host species:	bovine
Serotype:	SAT2
Topotype:	VII
Lineage:	Lib-12
Sublineage:	
Sequence length:	642
Ambiguities:	3
Material submitted for sequencing:	n/a
Harvest date of material:	n/a
Primers:	n/a
Received for sequencing:	n/a
Created:	01/12/2020
Last updated:	01/12/2020
VIBASys IDs: sample 45702, genome 45703, sequence viba_45704, sequencing info 45705	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_41092	NIG/3/14b	cattle	94.9	0	SAT2	VII	Lib-12	
viba_36870	CAR/G5819/2015	cattle	94.9	0	SAT2	VII	Lib-12	
viba_41084	NIG/1/14b	cattle	94.9	0	SAT2	VII	Lib-12	
viba_41088	NIG/2/14b	cattle	94.9	0	SAT2	VII	Lib-12	
viba_40795	GHA/Tul/2/2018	cattle	94.7	0	SAT2	VII	Lib-12	
viba_40799	GHA/Tul/5/2018	cattle	94.7	0	SAT2	VII	Lib-12	
viba_37103	CHD/7/2016	cattle	93.9	0	SAT2	VII	Lib-12	
viba_20477	CAR/10/2012		93.3	0	SAT2	VII	Lib-12	
viba_42964	BAU/TR/1/NIG/2018	bovine	93.3	0	SAT2	VII	Lib-12	
viba_20469	CAR/8/2012		93.3	0	SAT2	VII	Lib-12	

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_742	CAR/8/2005	cattle	87.0	0	SAT2	VII		
viba_424	SAU/6/2000	bovine	86.4	1	SAT2	VII		
viba_127	KEN/3/57		74.4	0	SAT2	IX		
viba_756	UGA/19/98		74.1	0	SAT2	X		
viba_374	ZAI/1/74		73.9	0	SAT2	VIII		
viba_369	UGA/51/75	bovine	73.9	0	SAT2	XII		
viba_380	RHO/1/48		73.2	0	SAT2	III		
viba_470	KEN/2/84	bovine	73.2	0	SAT2	IX		
viba_189	RWA/1/2000		72.9	0	SAT2	VIII		
viba_193	SUD/6/77		72.9	0	SAT2	XIII		

Report on FMDV SAT2 in Nigeria in 2019

Batch: WRLMEG/2020/00037



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_SAT2
Query sequence set:	WRLMEG/2020/00037-Nigeria-SAT2 (2 sequences)
Sequence database set:	allseqs_SAT2 (1032 sequences)
Prototype sequence set:	!prototypes_SAT2 (25 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	642
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/SAT2

label	accession	host(s)	lab	country	taxonomic information
LAG/IBJ/01/NIG/2019*	n/a	bovine	NCFAD/NVRI	Nigeria	VII/Lib-12
GHA/Tul/5/2018*	LC456875	cattle	NIAH-JAPAN	Ghana	VII/Lib-12
GHA/Tul/2/2018*	LC456874	cattle	NIAH-JAPAN	Ghana	VII/Lib-12
BAU/TR/1/NIG/2018*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
CHD/7/2016*	MH748579	cattle	ANSES	Chad	VII/Lib-12
NIG/3/14b*	MH894446	cattle	PIADC	Nigeria	VII/Lib-12
NIG/2/14b*	MH894445	cattle	PIADC	Nigeria	VII/Lib-12
NIG/1/14b*	MH894444	cattle	PIADC	Nigeria	VII/Lib-12
CAR/G5819/2015*	MG873224	cattle	PIADC	Cameroon	VII/Lib-12
PL/KWK/02/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
PL/PKN/02/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
PL/PKN/01/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
PL/JS/KA/1/17/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
NIG/1/2017*	MT239383	cattle	Sciensano	Nigeria	VII/Lib-12
PL/LANG/02/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
PL/WAS/01/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
PL/WAS/03/NIG/2017*	n/a	bovine	CFIA/NVRI	Nigeria	VII/Lib-12
ERI/1/2019	n/a	bovine	WRLFMD	Eritrea	VII/Lib-12
ETH/1/2018	MN987552	cattle	WRLFMD	Ethiopia	VII/Lib-12
EGY/Sharqia4/2018*	MK493340	n/a	MEVAC	Egypt	VII/Lib-12
EGY/Sharqia3/2018*	MK493339	n/a	MEVAC	Egypt	VII/Lib-12
EGY/7/2018	n/a	cattle	WRLFMD	Egypt	VII/Lib-12
CAR/B001070/2012*	KY581675	cattle	PIADC	Cameroon	VII/Lib-12
CAR/37/2013	n/a	cattle	WRLFMD	Cameroon	VII/Lib-12
CAR/34/2013	n/a	cattle	WRLFMD	Cameroon	VII/Lib-12
CAR/12/2013	n/a	cattle	WRLFMD	Cameroon	VII/Lib-12
CAR/16/2013	n/a	cattle	WRLFMD	Cameroon	VII/Lib-12
LIB/41/2012	JX570635	cattle	WRLFMD	Libya	VII/Lib-12
LIB/39/2012	JX570633	cattle	WRLFMD	Libya	VII/Lib-12
LIB/40/2012	JX570634	cattle	WRLFMD	Libya	VII/Lib-12
CAR/G3852/2012*	KY581672	cattle	PIADC	Cameroon	VII/Lib-12
CAR/G3853/2012*	KY581671	cattle	PIADC	Cameroon	VII/Lib-12
CAR/G3808/2012*	KY581673	cattle	PIADC	Cameroon	VII/Lib-12
CAR/G3796/2012*	KY581674	cattle	PIADC	Cameroon	VII/Lib-12
CAR/8/2012	KX266287	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/78/2012	KX266291	bovine	WRLFMD	Cameroon	VII/Lib-12

continued on next page

label	accession	host(s)	lab	country	taxonomic information
CAR/1/2012	KX266283	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/4/2012	KX266286	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/3/2012	KX266285	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/2/2012	KX266284	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/9/2012	KX266288	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/10/2012	KX266289	n/a	WRLFMD	Cameroon	VII/Lib-12
CAR/24/2012	KX266290	bovine	WRLFMD	Cameroon	VII/Lib-12
KB/005/006/NIG/2019/iso*	n/a	bovine	NCFAD/NVRI	Nigeria	VII
MAU/3/2014	KX258074	cattle	WRLFMD	Mauritania	VII
MAU/2/2014	KX258073	cattle	WRLFMD	Mauritania	VII
MAU/1/2014	KX258072	cattle	WRLFMD	Mauritania	VII
MAU/5/2014	KX258075	cattle	WRLFMD	Mauritania	VII
NIG/1/2012	KX258094	bovine	WRLFMD	Nigeria	VII
NIG/2/2012	KX258095	bovine	WRLFMD	Nigeria	VII
NIG/3/2012	KX258096	bovine	WRLFMD	Nigeria	VII
NIG/13/2011	KX258091	bovine	WRLFMD	Nigeria	VII
Nig/4/13*	MF624362	bovine	CODA-CERVA	Nigeria	VII
Nig/1/13*	MF624361	bovine	CODA-CERVA	Nigeria	VII
NIG/12/2011	KX258090	bovine	WRLFMD	Nigeria	VII
Nig/2/13*	MF624359	bovine	CODA-CERVA	Nigeria	VII
NIG/9/2011	KX258088	bovine	WRLFMD	Nigeria	VII
NIG/8/2011	KX258087	bovine	WRLFMD	Nigeria	VII
Nig/22/12*	MH590646	bovine	Sciensano	Nigeria	VII
Nig/23/12*	MH590645	bovine	Sciensano	Nigeria	VII
Nig/25/12*	MH590642	bovine	Sciensano	Nigeria	VII
Nig/20/12*	MH590648	bovine	Sciensano	Nigeria	VII
Nig/26/12*	MH590641	bovine	Sciensano	Nigeria	VII
Nig/15/12*	MH580476	bovine	Sciensano	Nigeria	VII
Nig/8/12*	MH580473	bovine	Sciensano	Nigeria	VII
Nig/9/12*	MH580474	bovine	Sciensano	Nigeria	VII
Nig/7/12*	MH580472	bovine	Sciensano	Nigeria	VII
Nig/2/12*	MH580468	bovine	Sciensano	Nigeria	VII
Nig/5/12*	MH580470	bovine	Sciensano	Nigeria	VII
Nig/6/12*	MH580471	bovine	Sciensano	Nigeria	VII
NIG/7/2011	KX258086	bovine	WRLFMD	Nigeria	VII
Nig/3/12*	MH580469	bovine	Sciensano	Nigeria	VII
Nig/28/12*	MH590644	bovine	Sciensano	Nigeria	VII
NIG/10/2011	KX258089	bovine	WRLFMD	Nigeria	VII
Nig/14/12*	MH590643	bovine	Sciensano	Nigeria	VII
NIG/3/2008	KX258078	cattle	WRLFMD	Nigeria	VII
NIG/1/2008	KX258076	cattle	WRLFMD	Nigeria	VII
NIG/8/2008	KX258083	cattle	WRLFMD	Nigeria	VII
NIG/2/2008	KX258077	cattle	WRLFMD	Nigeria	VII
NIG/4/2008	KX258079	cattle	WRLFMD	Nigeria	VII
NIG/6/2008	KX258081	cattle	WRLFMD	Nigeria	VII
NIG/7/2008	KX258082	cattle	WRLFMD	Nigeria	VII
NIG/5/2008	KX258080	cattle	WRLFMD	Nigeria	VII
NIG/2/2007	JX570636	cattle	WRLFMD	Nigeria	VII
SUD/1/2007	GU566071	cattle	WRLFMD	Sudan	VII
SAU/6/2000	AF367135	bovine	OVI	Saudi Arabia	VII
CAR/8/2005	JX570616	cattle	WRLFMD	Cameroon	VII
ETH/2/2007	FJ798161	cattle	WRLFMD	Ethiopia	XIII
SUD/6/77	AY343939	n/a	OVI	Sudan	XIII
ZAI/1/74	DQ009737	n/a	OVI	Zaire	VIII
RWA/1/2000*	AF367134	n/a	OVI	Rwanda	VIII
KEN/3/57	AJ251473	n/a	WRLFMD	Kenya	IX
KEN/2/84	AY343941	bovine	OVI	Kenya	IX
UGA/51/75	AY343963	bovine	OVI	Uganda	XII
ZAI/1/82	AF367100	bovine	OVI	Zaire	X
UGA/19/98	AY343969	n/a	OVI	Uganda	X
RHO/1/48	AY593847	n/a	PIADC	Rhodesia	III
SA/106/59	AY593848	n/a	PIADC	South Africa (SA)	I

*, not a WRLFMD Reference Number
n/a, not available