

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

## Genotyping Report

FMDV serotype: SAT2  
Country: Namibia  
Year: 2020  
Batch: WRLMEG/2021/00003  
No. of sequences: 2  
Report date: 1st March 2021  
Report generated by: Nick Knowles  
Report checked by: Jemma Wadsworth

This report is prepared on behalf of the OIE Sub-Saharan Africa Regional Reference laboratory (SSARRL) for FMD (Botswana Vaccine Institute, Gaborone, Botswana) and covers VP1 sequences submitted to the WRLFMD on 25 February 2021.



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Virus sample name:	NAM06/2021
Sender reference:	SAT2/NAM06/2021
Location of origin:	n/a
Country of origin:	Namibia
Date of collection:	2020
Host species:	bovine
Serotype:	SAT2
Topotype:	III
Lineage:	
Sublineage:	
Sequence length:	642
Ambiguities:	0
Material submitted for sequencing:	Epithelial tissue RNA extract
Harvest date of material:	n/a
Primers:	SAT2-P1-1223F/SAT-2B208R
Received for sequencing:	n/a
Created:	25/02/2021
Last updated:	25/02/2021
VIBASys IDs: sample 47501, genome 47502, sequence viba_47503, sequencing info 47504	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_47507	NAM08/2021	bovine	99.2	0	SAT2	III		
viba_3519	BOT/P3/98 VUM-29	African buffalo	88.0	0	SAT2	III		
viba_451	BOT/P3/98 VUM-29	African buffalo	87.6	1	SAT2	III		
viba_7850	BOT/3/2005	cattle	86.7	0	SAT2	III		
viba_7870	BOT/8/2005	cattle	86.7	0	SAT2	III		
viba_7842	BOT/1/2005	cattle	86.7	0	SAT2	III		
viba_7862	BOT/6/2005	cattle	86.7	0	SAT2	III		
viba_1620	BOT/1/80	cattle	86.6	0	SAT2	III		
viba_7854	BOT/4/2005	cattle	86.5	0	SAT2	III		
viba_7846	BOT/2/2005	cattle	86.5	0	SAT2	III		

#### 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_451	BOT/P3/98 VUM-29	African buffalo	87.6	1	SAT2	III		
viba_380	RHO/1/48		83.5	0	SAT2	III		
viba_248	KEN/1/84	bovine	79.7	0	SAT2	IV		
viba_273	ETH/1/90	bovine	79.2	0	SAT2	IV		
viba_183	ZIM/14/2002	bovine	79.1	0	SAT2	I		
viba_752	SA/106/59		78.9	0	SAT2	I		
viba_111	MAL/1/2003	bovine	77.7	0	SAT2	I		
viba_567	ZIM/7/83	bovine	74.7	0	SAT2	II		
viba_546	ZIM/5/81	bovine	72.9	0	SAT2	II		
viba_529	GAM/8/79	bovine	72.8	0	SAT2	VI		

Virus sample name:	NAM08/2021
Sender reference:	SAT2/NAM08/2021
Location of origin:	n/a
Country of origin:	Namibia
Date of collection:	03/11/2020
Host species:	bovine
Serotype:	SAT2
Topotype:	III
Lineage:	
Sublineage:	
Sequence length:	642
Ambiguities:	0
Material submitted for sequencing:	Epithelial tissue RNA extract
Harvest date of material:	n/a
Primers:	SAT2-P1-1223F/SAT-2B208R
Received for sequencing:	n/a
Created:	25/02/2021
Last updated:	25/02/2021
VIBASys IDs: sample 47505, genome 47506, sequence viba_47507, sequencing info 47508	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_47503	NAM06/2021	bovine	99.2	0	SAT2	III		
viba_3519	BOT/P3/98 VUM-29	African buffalo	88.2	0	SAT2	III		
viba_451	BOT/P3/98 VUM-29	African buffalo	87.7	1	SAT2	III		
viba_7850	BOT/3/2005	cattle	86.8	0	SAT2	III		
viba_7870	BOT/8/2005	cattle	86.8	0	SAT2	III		
viba_7842	BOT/1/2005	cattle	86.8	0	SAT2	III		
viba_7862	BOT/6/2005	cattle	86.8	0	SAT2	III		
viba_7854	BOT/4/2005	cattle	86.7	0	SAT2	III		
viba_7846	BOT/2/2005	cattle	86.7	0	SAT2	III		
viba_1620	BOT/1/80	cattle	86.5	0	SAT2	III		

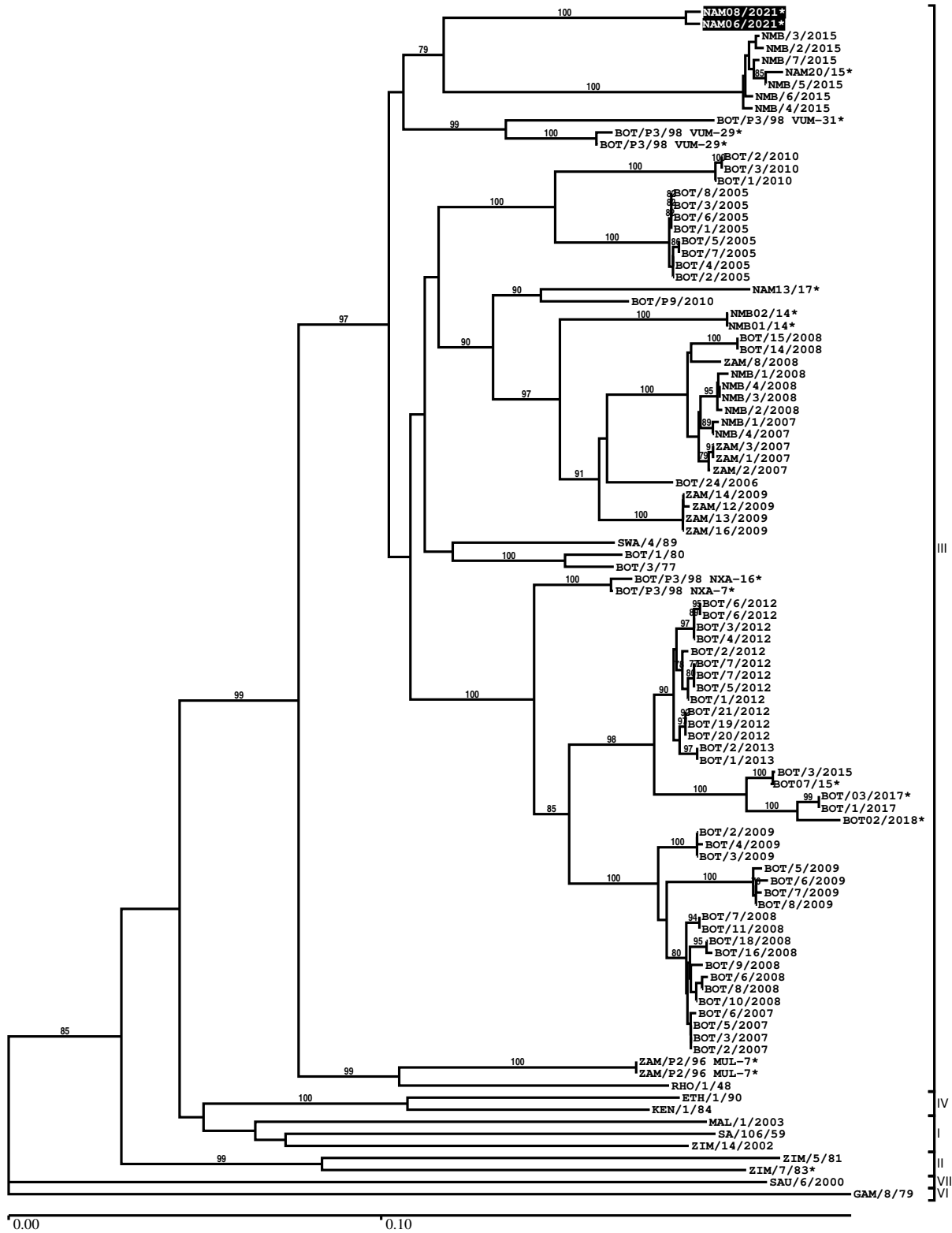
#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_451	BOT/P3/98 VUM-29	African buffalo	87.7	1	SAT2	III		
viba_380	RHO/1/48		83.3	0	SAT2	III		
viba_248	KEN/1/84	bovine	79.5	0	SAT2	IV		
viba_183	ZIM/14/2002	bovine	79.2	0	SAT2	I		
viba_273	ETH/1/90	bovine	79.1	0	SAT2	IV		
viba_752	SA/106/59		78.9	0	SAT2	I		
viba_111	MAL/1/2003	bovine	77.8	0	SAT2	I		
viba_567	ZIM/7/83	bovine	74.6	0	SAT2	II		
viba_546	ZIM/5/81	bovine	73.3	0	SAT2	II		
viba_424	SAU/6/2000	bovine	72.5	1	SAT2	VII		

Report on FMDV SAT2 in Namibia in 2020

Batch: WRLMEG/2021/00003



\*, not a WRLFMD Reference Number

## Analysis Parameters

VP1 subsequence extractor: vp1\_SAT2  
 Query sequence set: WRLMEG/2021/00003-Namibia-SAT2 (2 sequences)  
 Sequence database set: allseqs\_SAT2 (1035 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: 643  
 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/SAT2

label	accession	host(s)	lab	country	taxonomic information
NAM08/2021*	n/a	bovine	BVI	Namibia	III
NAM06/2021*	n/a	bovine	BVI	Namibia	III
NMB/3/2015	n/a	bovine	WRLFMD	Namibia	III
NMB/2/2015	n/a	bovine	WRLFMD	Namibia	III
NMB/7/2015	n/a	bovine	WRLFMD	Namibia	III
NAM20/15*	n/a	cattle	BVI	Namibia (NAM)	III
NMB/5/2015	n/a	bovine	WRLFMD	Namibia	III
NMB/6/2015	n/a	bovine	WRLFMD	Namibia	III
NMB/4/2015	n/a	bovine	WRLFMD	Namibia	III
BOT/P3/98 VUM-31*	AF367125	African buffalo	OVI	Botswana	III
BOT/P3/98 VUM-29*	AF367124	African buffalo	OVI	Botswana	III
BOT/P3/98 VUM-29*	KY091305	African buffalo	WRLFMD	Botswana	III
BOT/2/2010	n/a	cattle	WRLFMD	Botswana	III
BOT/3/2010	n/a	cattle	WRLFMD	Botswana	III
BOT/1/2010	n/a	cattle	WRLFMD	Botswana	III
BOT/8/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/3/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/6/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/1/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/5/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/7/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/4/2005	n/a	cattle	WRLFMD	Botswana	III
BOT/2/2005	n/a	cattle	WRLFMD	Botswana	III
NAM13/17*	n/a	bovine	BVI	Namibia	III
BOT/P9/2010	n/a	African buffalo	WRLFMD	Botswana	III
NMB02/14*	n/a	cattle	BVI	Namibia	III
NMB01/14*	n/a	cattle	BVI	Namibia	III
BOT/15/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/14/2008	n/a	cattle	WRLFMD	Botswana	III
ZAM/8/2008	n/a	cattle	WRLFMD	Zambia	III
NMB/1/2008	n/a	cattle	WRLFMD	Namibia	III
NMB/4/2008	n/a	cattle	WRLFMD	Namibia	III
NMB/3/2008	n/a	cattle	WRLFMD	Namibia	III
NMB/2/2008	n/a	cattle	WRLFMD	Namibia	III
NMB/1/2007	n/a	cattle	WRLFMD	Namibia	III

*continued on next page*

label	accession	host(s)	lab	country	taxonomic information
NMB/4/2007	n/a	cattle	WRLFMD	Namibia	III
ZAM/3/2007	n/a	n/a	WRLFMD	Zambia	III
ZAM/1/2007	n/a	n/a	WRLFMD	Zambia	III
ZAM/2/2007	n/a	n/a	WRLFMD	Zambia	III
BOT/24/2006	n/a	African buffalo	WRLFMD	Botswana	III
ZAM/14/2009	n/a	cattle	WRLFMD	Zambia	III
ZAM/12/2009	n/a	cattle	WRLFMD	Zambia	III
ZAM/13/2009	n/a	cattle	WRLFMD	Zambia	III
ZAM/16/2009	n/a	cattle	WRLFMD	Zambia	III
SWA/4/89	KF112969	cattle	WRLFMD	South West Africa	III
BOT/1/80	KF112929	cattle	WRLFMD	Botswana	III
BOT/3/77	KF112928	cattle	OVI	Botswana	III
BOT/P3/98 NXA-16*	n/a	African buffalo	WRLFMD	Botswana	III
BOT/P3/98 NXA-7*	n/a	African buffalo	WRLFMD	Botswana	III
BOT/6/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/6/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/3/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/4/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/2/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/7/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/7/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/5/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/1/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/21/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/19/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/20/2012	n/a	bovine	WRLFMD	Botswana	III
BOT/2/2013	n/a	bovine	WRLFMD	Botswana	III
BOT/1/2013	n/a	bovine	WRLFMD	Botswana	III
BOT/3/2015	n/a	bovine	WRLFMD	Botswana	III
BOT07/15*	n/a	bovine	BVI	Botswana	III
BOT/03/2017*	n/a	cattle	BVI	Botswana	III
BOT/1/2017	n/a	cattle	WRLFMD	Botswana	III
BOT02/2018*	n/a	cattle	BVI	Botswana	III
BOT/2/2009	n/a	cattle	WRLFMD	Botswana	III
BOT/4/2009	n/a	cattle	WRLFMD	Botswana	III
BOT/3/2009	n/a	cattle	WRLFMD	Botswana	III
BOT/5/2009	n/a	n/a	WRLFMD	Botswana	III
BOT/6/2009	n/a	n/a	WRLFMD	Botswana	III
BOT/7/2009	n/a	n/a	WRLFMD	Botswana	III
BOT/8/2009	n/a	n/a	WRLFMD	Botswana	III
BOT/7/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/11/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/18/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/16/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/9/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/6/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/8/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/10/2008	n/a	cattle	WRLFMD	Botswana	III
BOT/6/2007	n/a	cattle	WRLFMD	Botswana	III
BOT/5/2007	n/a	cattle	WRLFMD	Botswana	III
BOT/3/2007	n/a	cattle	WRLFMD	Botswana	III
BOT/2/2007	n/a	cattle	WRLFMD	Botswana	III
ZAM/P2/96 MUL-7*	n/a	African buffalo	WRLFMD	Zambia	III
ZAM/P2/96 MUL-7*	AF367120	African buffalo	OVI	Zambia	III
RHO/1/48	AY593847	n/a	PIADC	Rhodesia	III
ETH/1/90	AY343935	bovine	OVI	Ethiopia	IV
KEN/1/84	AY344505	bovine	OVI	Kenya	IV
MAL/1/2003	n/a	bovine	WRLFMD	Malawi	I
SA/106/59	AY593848	n/a	PIADC	South Africa (SA)	I
ZIM/14/2002	KF219689	bovine	WRLFMD	Zimbabwe	I
ZIM/5/81	EF134951	bovine	WRLFMD	Zimbabwe	II
ZIM/7/83*	AF136607	bovine	OVI	Zimbabwe	II
SAU/6/2000	AF367135	bovine	OVI	Saudi Arabia	VII
GAM/8/79	AF479410	bovine	OVI	Gambia	VI

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