

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

Genotyping Report

Report Date for this Batch: 15 December 2015

FMDV type SAT 2

Country: Zimbabwe

Period: 2015

No. of samples: 11

BATCH: WRLFMD/2015/000027



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Notes:

- 1) Sample ZIM/7/2015 (935/15) was typed as both SAT1 and SAT 2. RT-PCR amplification of the VP1 region detected both serotypes, but the sequence data was of poor quality and is not reported here.
- 2) Samples ZIM/8/2015 was typed as SAT 2, but the sequences appeared to be very heterogeneous and the sample may contain multiple SAT 2 variants. The sequence(s) are not reported here.
- 3) The VP1 sequences from the other samples fell into three distinct genetic lineages within SAT 2 topotype II. Most of the SAT 2 viruses of this topotype, collected from African buffalo, were sampled in the Hwange NP or Botswana (Ngoma, Chobe NP; Nxaraga, Okavango Delta), possibly suggesting multiple origins in western Zimbabwe.

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Serotype: SAT2 WRLFMD Ref No: ZIM/4/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1134/15 Location: Reitfontein Diptank, Gweru, Midlands, Zimbabwe Date collected: 07/04/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 30/10/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-04.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/9/2015	ZIM15-09	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/1/2014	ZIM14-01	648	640	0	98.77	1.23	II	unnamed
3	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	620	0	98.73	1.27	II	unnamed
4	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	627	0	98.58	1.42	II	unnamed
5	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	617	0	98.56	1.44	II	unnamed
6	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	604	0	98.53	1.47	II	unnamed
7	SAT2/ZIM/20/2015	ZIM15-20	648	638	0	98.46	1.54	II	unnamed
8	SAT2/ZIM/21/2015	ZIM15-21	648	638	0	98.46	1.54	II	unnamed
9	SAT2/ZIM/6/2015	ZIM15-06	648	638	0	98.46	1.54	II	unnamed
10	SAT2/ZIM/1/2015	ZIM15-01	648	637	0	98.30	1.70	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	582	0	89.81	10.19	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	523	0	80.71	19.29	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	497	0	76.70	23.30	I	unnamed
4	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	493	0	76.08	23.92	III	unnamed
5	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	492	0	75.93	24.07	I	unnamed
6	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	490	1	75.73	24.27	III	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	490	0	75.62	24.38	IV	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	490	0	75.62	24.38	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	485	0	74.85	25.15	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	482	0	74.38	25.62	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2	Report date: 14/12/2015
WRLFMD Ref No: ZIM/5/2015	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00027	Checked by: K. Bachanek-Bankowska
Sender Ref: 0888/15	
Location: Chibasa, Gokwe, Midlands, Zimbabwe	Topotype: II
Date collected: 03/06/2015	Genotype/strain: unnamed
Date received by WRLFMD: 03/09/2015	Sequence filename: ZIM15-05.SEQ
Date received for sequencing: 26/11/2015	Date sequence last updated: 14/12/2015
Species: Bovine	No. of Nt determined: 648
Material used: BTY1 30/10/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 719
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 102 days
	Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/15/2015	ZIM15-15	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/16/2015	ZIM15-16	648	646	0	99.69	0.31	II	unnamed
3	SAT2/BOT/P3/2000 NGO-15	BOT00NAD	647	611	1	94.44	5.56	II	unnamed
4	SAT2/ZIM/6/88 buffalo	ZIM88B06	648	595	0	91.82	8.18	II	unnamed
5	SAT2/ZIM/14/89 buffalo	ZIM89B14	648	593	0	91.51	8.49	II	unnamed
6	SAT2/ZIM/5/88 buffalo	ZIM88B05	648	593	0	91.51	8.49	II	unnamed
7	SAT2/ZIM/7/88 buffalo	ZIM88B07	648	593	0	91.51	8.49	II	unnamed
8	SAT2/ZIM/9/88 buffalo	ZIM88B09	648	593	0	91.51	8.49	II	unnamed
9	SAT2/ZIM/1/88 buffalo	ZIM88B01	648	592	0	91.36	8.64	II	unnamed
10	SAT2/ZIM/31/89 buffalo	ZIM89B31	648	592	0	91.36	8.64	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	589	0	90.90	9.10	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	516	0	79.63	20.37	II	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	495	0	76.39	23.61	III	unnamed
4	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	494	0	76.23	23.77	IV	unnamed
5	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	493	1	76.20	23.80	III	unnamed
6	SAT2/MAL/1/2003	MAL03-01	648	488	0	75.31	24.69	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	486	0	75.00	25.00	IV	unnamed
8	SAT2/SA/106/59 (AY593848)	RSA59--A	648	486	0	75.00	25.00	I	unnamed
9	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	483	0	74.54	25.46	I	unnamed
10	SAT2/ANG/4/74 (AF479417)	ANG74-04	648	482	0	74.38	25.62	XI	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2	Report date: 14/12/2015
WRLFMD Ref No: ZIM/6/2015	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00027	Checked by: K. Bachanek-Bankowska
Sender Ref: 0913/15	
Location: Gweru, Midlands, Zimbabwe	Topotype: II
Date collected: 06/06/2015	Genotype/strain: unnamed
Date received by WRLFMD: 03/09/2015	Sequence filename: ZIM15-06.SEQ
Date received for sequencing: 26/11/2015	Date sequence last updated: 14/12/2015
Species: Bovine	No. of Nt determined: 648
Material used: BTY2 14/11/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 719
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 102 days
	Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/20/2015	ZIM15-20	648	646	0	99.69	0.31	II	unnamed
2	SAT2/ZIM/21/2015	ZIM15-21	648	646	0	99.69	0.31	II	unnamed
3	SAT2/ZIM/22/2015	ZIM15-22	648	645	0	99.54	0.46	II	unnamed
4	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	628	0	98.74	1.26	II	unnamed
5	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	618	0	98.72	1.28	II	unnamed
6	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	605	0	98.69	1.31	II	unnamed
7	SAT2/ZIM/9/2015	ZIM15-09	648	639	0	98.61	1.39	II	unnamed
8	SAT2/ZIM/1/2014	ZIM14-01	648	638	0	98.46	1.54	II	unnamed
9	SAT2/ZIM/4/2015	ZIM15-04	648	638	0	98.46	1.54	II	unnamed
10	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	618	0	98.41	1.59	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	583	0	89.97	10.03	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	521	0	80.40	19.60	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	495	0	76.39	23.61	I	unnamed
4	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	492	0	75.93	24.07	III	unnamed
5	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	490	1	75.73	24.27	III	unnamed
6	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	489	0	75.46	24.54	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	488	0	75.31	24.69	IV	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	485	0	74.85	25.15	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	483	0	74.54	25.46	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	480	0	74.07	25.93	V	unnamed

nt, nucleotides

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Serotype: SAT2 WRLFMD Ref No: ZIM/9/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1002/15(1) Location: Brooklands Diptank, Shurugwi, Midlands, Zimbabwe Date collected: 18/06/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 12/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-09.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/4/2015	ZIM15-04	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/1/2014	ZIM14-01	648	641	0	98.92	1.08	II	unnamed
3	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	621	0	98.89	1.11	II	unnamed
4	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	628	0	98.74	1.26	II	unnamed
5	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	618	0	98.72	1.28	II	unnamed
6	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	605	0	98.69	1.31	II	unnamed
7	SAT2/ZIM/20/2015	ZIM15-20	648	639	0	98.61	1.39	II	unnamed
8	SAT2/ZIM/21/2015	ZIM15-21	648	639	0	98.61	1.39	II	unnamed
9	SAT2/ZIM/6/2015	ZIM15-06	648	639	0	98.61	1.39	II	unnamed
10	SAT2/ZIM/1/2015	ZIM15-01	648	638	0	98.46	1.54	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	583	0	89.97	10.03	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	524	0	80.86	19.14	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	496	0	76.54	23.46	I	unnamed
4	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	494	0	76.23	23.77	III	unnamed
5	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	492	0	75.93	24.07	I	unnamed
6	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	491	0	75.77	24.23	IV	unnamed
7	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	490	1	75.73	24.27	III	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	490	0	75.62	24.38	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	486	0	75.00	25.00	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	481	0	74.23	25.77	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/11/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1007/15(1) & 1007/15(2) Location: Reigate Farm, Bulawayo, Mataberland North, Zimbabwe Date collected: 23/06/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 18/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-11.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/1/2015	ZIM15-01	648	644	0	99.38	0.62	II	unnamed
2	SAT2/ZIM/1/2014	ZIM14-01	648	637	0	98.30	1.70	II	unnamed
3	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	617	0	98.25	1.75	II	unnamed
4	SAT2/ZIM/9/2015	ZIM15-09	648	636	0	98.15	1.85	II	unnamed
5	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	624	0	98.11	1.89	II	unnamed
6	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	614	0	98.08	1.92	II	unnamed
7	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	601	0	98.04	1.96	II	unnamed
8	SAT2/ZIM/4/2015	ZIM15-04	648	635	0	97.99	2.01	II	unnamed
9	SAT2/ZIM/6/2015	ZIM15-06	648	635	0	97.99	2.01	II	unnamed
10	SAT2/ZIM/20/2015	ZIM15-20	648	633	0	97.69	2.31	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	582	0	89.81	10.19	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	524	0	80.86	19.14	II	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	496	0	76.54	23.46	III	unnamed
4	SAT2/SA/106/59 (AY593848)	RSA59--A	648	495	0	76.39	23.61	I	unnamed
5	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	492	1	76.04	23.96	III	unnamed
6	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	488	0	75.31	24.69	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	487	0	75.15	24.85	IV	unnamed
8	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	487	0	75.15	24.85	IV	unnamed
9	SAT2/MAL/1/2003	MAL03-01	648	485	0	74.85	25.15	I	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	480	0	74.07	25.93	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/13/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1493/15(1) & 1493/15(2) Location: Pugwebu Aisley Farm, Bulawayo, Mataberland North, Zimbabwe Date collected: 07/07/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 18/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-13.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/2/2010	ZIM10-02	648	590	0	91.05	8.95	II	Unnamed
2	SAT2/ZIM/4/2010	ZIM10-04	648	590	0	91.05	8.95	II	Unnamed
3	SAT2/ZIM/1/2015	ZIM15-01	648	586	0	90.43	9.57	II	unnamed
4	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	567	0	90.29	9.71	II	unnamed
5	SAT2/ZIM/1/2014	ZIM14-01	648	585	0	90.28	9.72	II	unnamed
6	SAT2/ZIM/9/2015	ZIM15-09	648	584	0	90.12	9.88	II	unnamed
7	SAT2/ZIM/4/2015	ZIM15-04	648	583	0	89.97	10.03	II	unnamed
8	SAT2/ZIM/11/2015	ZIM15-11	648	582	0	89.81	10.19	II	unnamed
9	SAT2/BOT-BUFF/170/74 (buffalo)	BOT74B170	648	581	0	89.66	10.34	II	unnamed
10	SAT2/ZIM/14/89 buffalo	ZIM89B14	648	580	0	89.51	10.49	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	571	0	88.12	11.88	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	527	0	81.33	18.67	II	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	500	0	77.16	22.84	III	unnamed
4	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	495	0	76.39	23.61	IV	unnamed
5	SAT2/SA/106/59 (AY593848)	RSA59--A	648	493	0	76.08	23.92	I	unnamed
6	SAT2/MAL/1/2003	MAL03-01	648	491	0	75.77	24.23	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	487	0	75.15	24.85	IV	unnamed
8	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	486	1	75.12	24.88	III	unnamed
9	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	485	0	74.85	25.15	I	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	476	0	73.46	26.54	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/15/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 934/15 Location: Gokwe Def Diptank, Gokwe, Midlands, Zimbabwe Date collected: 17/07/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 18/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-15.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/16/2015	ZIM15-16	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/5/2015	ZIM15-05	648	647	0	99.85	0.15	II	unnamed
3	SAT2/BOT/P3/2000 NGO-15	BOT00NAD	647	612	1	94.59	5.41	II	unnamed
4	SAT2/ZIM/6/88 buffalo	ZIM88B06	648	596	0	91.98	8.02	II	unnamed
5	SAT2/ZIM/14/89 buffalo	ZIM89B14	648	594	0	91.67	8.33	II	unnamed
6	SAT2/ZIM/5/88 buffalo	ZIM88B05	648	594	0	91.67	8.33	II	unnamed
7	SAT2/ZIM/7/88 buffalo	ZIM88B07	648	594	0	91.67	8.33	II	unnamed
8	SAT2/ZIM/9/88 buffalo	ZIM88B09	648	594	0	91.67	8.33	II	unnamed
9	SAT2/ZIM/1/88 buffalo	ZIM88B01	648	593	0	91.51	8.49	II	unnamed
10	SAT2/ZIM/31/89 buffalo	ZIM89B31	648	593	0	91.51	8.49	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	588	0	90.74	9.26	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	517	0	79.78	20.22	II	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	495	0	76.39	23.61	III	unnamed
4	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	494	0	76.23	23.77	IV	unnamed
5	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	493	1	76.20	23.80	III	unnamed
6	SAT2/MAL/1/2003	MAL03-01	648	488	0	75.31	24.69	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	486	0	75.00	25.00	IV	unnamed
8	SAT2/SA/106/59 (AY593848)	RSA59--A	648	486	0	75.00	25.00	I	unnamed
9	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	483	0	74.54	25.46	I	unnamed
10	SAT2/ANG/4/74 (AF479417)	ANG74-04	648	482	0	74.38	25.62	XI	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/16/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1226/15 Location: Gokwe Def Diptank, Gokwe, Midlands, Zimbabwe Date collected: 20/07/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 18/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-16.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/15/2015	ZIM15-15	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/5/2015	ZIM15-05	648	646	0	99.69	0.31	II	unnamed
3	SAT2/BOT/P3/2000 NGO-15	BOT00NAD	647	611	1	94.44	5.56	II	unnamed
4	SAT2/ZIM/6/88 buffalo	ZIM88B06	648	597	0	92.13	7.87	II	unnamed
5	SAT2/ZIM/14/89 buffalo	ZIM89B14	648	595	0	91.82	8.18	II	unnamed
6	SAT2/ZIM/5/88 buffalo	ZIM88B05	648	595	0	91.82	8.18	II	unnamed
7	SAT2/ZIM/7/88 buffalo	ZIM88B07	648	595	0	91.82	8.18	II	unnamed
8	SAT2/ZIM/9/88 buffalo	ZIM88B09	648	595	0	91.82	8.18	II	unnamed
9	SAT2/ZIM/1/88 buffalo	ZIM88B01	648	594	0	91.67	8.33	II	unnamed
10	SAT2/ZIM/31/89 buffalo	ZIM89B31	648	594	0	91.67	8.33	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	587	0	90.59	9.41	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	516	0	79.63	20.37	II	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	496	0	76.54	23.46	III	unnamed
4	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	493	0	76.08	23.92	IV	unnamed
5	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	492	1	76.04	23.96	III	unnamed
6	SAT2/MAL/1/2003	MAL03-01	648	487	0	75.15	24.85	I	unnamed
7	SAT2/SA/106/59 (AY593848)	RSA59--A	648	487	0	75.15	24.85	I	unnamed
8	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	485	0	74.85	25.15	IV	unnamed
9	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	482	0	74.38	25.62	I	unnamed
10	SAT2/ANG/4/74 (AF479417)	ANG74-04	648	481	0	74.23	25.77	XI	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/20/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1394/15 (A) Location: Marivale Diptank, Kwekwe, Midlands, Zimbabwe Date collected: 12/08/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY2 14/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-20.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/21/2015	ZIM15-21	648	648	0	100.00	0.00	II	unnamed
2	SAT2/ZIM/22/2015	ZIM15-22	648	647	0	99.85	0.15	II	unnamed
3	SAT2/ZIM/6/2015	ZIM15-06	648	646	0	99.69	0.31	II	unnamed
4	SAT2/ZIM/9/2015	ZIM15-09	648	639	0	98.61	1.39	II	unnamed
5	SAT2/ZIM/1/2014	ZIM14-01	648	638	0	98.46	1.54	II	unnamed
6	SAT2/ZIM/4/2015	ZIM15-04	648	638	0	98.46	1.54	II	unnamed
7	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	626	0	98.43	1.57	II	unnamed
8	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	618	0	98.41	1.59	II	unnamed
9	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	616	0	98.40	1.60	II	unnamed
10	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	603	0	98.37	1.63	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	581	0	89.66	10.34	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	521	0	80.40	19.60	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	494	0	76.23	23.77	I	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	491	1	75.89	24.11	III	unnamed
5	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	491	0	75.77	24.23	III	unnamed
6	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	490	0	75.62	24.38	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	488	0	75.31	24.69	IV	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	486	0	75.00	25.00	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	484	0	74.69	25.31	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	480	0	74.07	25.93	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/21/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1394/15 (B) Location: Marivale Diptank, Kwekwe, Midlands, Zimbabwe Date collected: 12/08/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 26/11/2015 Species: Bovine Material used: BTY1 20/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-21.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 18 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/20/2015	ZIM15-20	648	648	0	100.00	0.00	II	unnamed
2	SAT2/ZIM/22/2015	ZIM15-22	648	647	0	99.85	0.15	II	unnamed
3	SAT2/ZIM/6/2015	ZIM15-06	648	646	0	99.69	0.31	II	unnamed
4	SAT2/ZIM/9/2015	ZIM15-09	648	639	0	98.61	1.39	II	unnamed
5	SAT2/ZIM/1/2014	ZIM14-01	648	638	0	98.46	1.54	II	unnamed
6	SAT2/ZIM/4/2015	ZIM15-04	648	638	0	98.46	1.54	II	unnamed
7	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	626	0	98.43	1.57	II	unnamed
8	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	618	0	98.41	1.59	II	unnamed
9	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	616	0	98.40	1.60	II	unnamed
10	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	603	0	98.37	1.63	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	581	0	89.66	10.34	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	521	0	80.40	19.60	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	494	0	76.23	23.77	I	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	491	1	75.89	24.11	III	unnamed
5	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	491	0	75.77	24.23	III	unnamed
6	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	490	0	75.62	24.38	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	488	0	75.31	24.69	IV	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	486	0	75.00	25.00	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	484	0	74.69	25.31	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	480	0	74.07	25.93	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: SAT2 WRLFMD Ref No: ZIM/22/2015 Batch No: WRLFMD/2015/00027 Sender Ref: 1425/15 Location: Sultana Ranch, Kwekwe, Midlands, Zimbabwe Date collected: 18/08/2015 Date received by WRLFMD: 03/09/2015 Date received for sequencing: 02/12/2015 Species: Bovine Material used: BTy1 20/11/2015 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 14/12/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: II Genotype/strain: unnamed Sequence filename: ZIM15-22.SEQ Date sequence last updated: 14/12/2015 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 719 Min. no. of nt for comparison: 600 Total turn-around time: 102 days Sequencing time: 12 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/20/2015	ZIM15-20	648	647	0	99.85	0.15	II	unnamed
2	SAT2/ZIM/21/2015	ZIM15-21	648	647	0	99.85	0.15	II	unnamed
3	SAT2/ZIM/6/2015	ZIM15-06	648	645	0	99.54	0.46	II	unnamed
4	SAT2/ZIM/9/2015	ZIM15-09	648	638	0	98.46	1.54	II	unnamed
5	SAT2/ZIM/1/2014	ZIM14-01	648	637	0	98.30	1.70	II	unnamed
6	SAT2/ZIM/4/2015	ZIM15-04	648	637	0	98.30	1.70	II	unnamed
7	SAT2/ZIM/14/13* (BVI)	ZIM13-AB	636	625	0	98.27	1.73	II	unnamed
8	SAT2/ZIM/11/2014 (BVI)	ZIM14-AA	628	617	0	98.25	1.75	II	unnamed
9	SAT2/ZIM/18/13* (BVI)	ZIM13-AD	626	615	0	98.24	1.76	II	unnamed
10	SAT2/ZIM/16/13* (BVI)	ZIM13-AC	613	602	0	98.21	1.79	II	unnamed
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	580	0	89.51	10.49	II	unnamed
2	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	520	0	80.25	19.75	II	unnamed
3	SAT2/SA/106/59 (AY593848)	RSA59--A	648	493	0	76.08	23.92	I	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	492	1	76.04	23.96	III	unnamed
5	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	492	0	75.93	24.07	III	unnamed
6	SAT2/ZIM/14/2002 (KF219689)	ZIM02-14	648	491	0	75.77	24.23	I	unnamed
7	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	489	0	75.46	24.54	IV	unnamed
8	SAT2/MAL/1/2003	MAL03-01	648	487	0	75.15	24.85	I	unnamed
9	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	483	0	74.54	25.46	IV	unnamed
10	SAT2/NIG/2/75 (AF367139)	NIG75-02	648	481	0	74.23	25.77	V	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Report on FMDV SAT 2 in Zimbabwe in 2015

Batch: WRLMEG/2015/00027

◆ indicates viruses in this batch

Software: MEGA 6.06

Analysis

----- Phylogeny Reconstruction

----- All Selected Taxa

----- Neighbor-joining

Phylogeny Test

----- Bootstrap method

----- 1000

Substitution Model

----- Nucleotide

----- Kimura 2-parameter model

----- d: Transitions + Transversions

Rates and Patterns

----- Uniform rates

----- Same (Homogeneous)

Data Subset to Use

----- Pairwise deletion

----- 1st+2nd+3rd+Non-Coding

No. of Sites : 651

No Of Bootstrap Reps = 1000

Only bootstrap values of 70% and above are shown

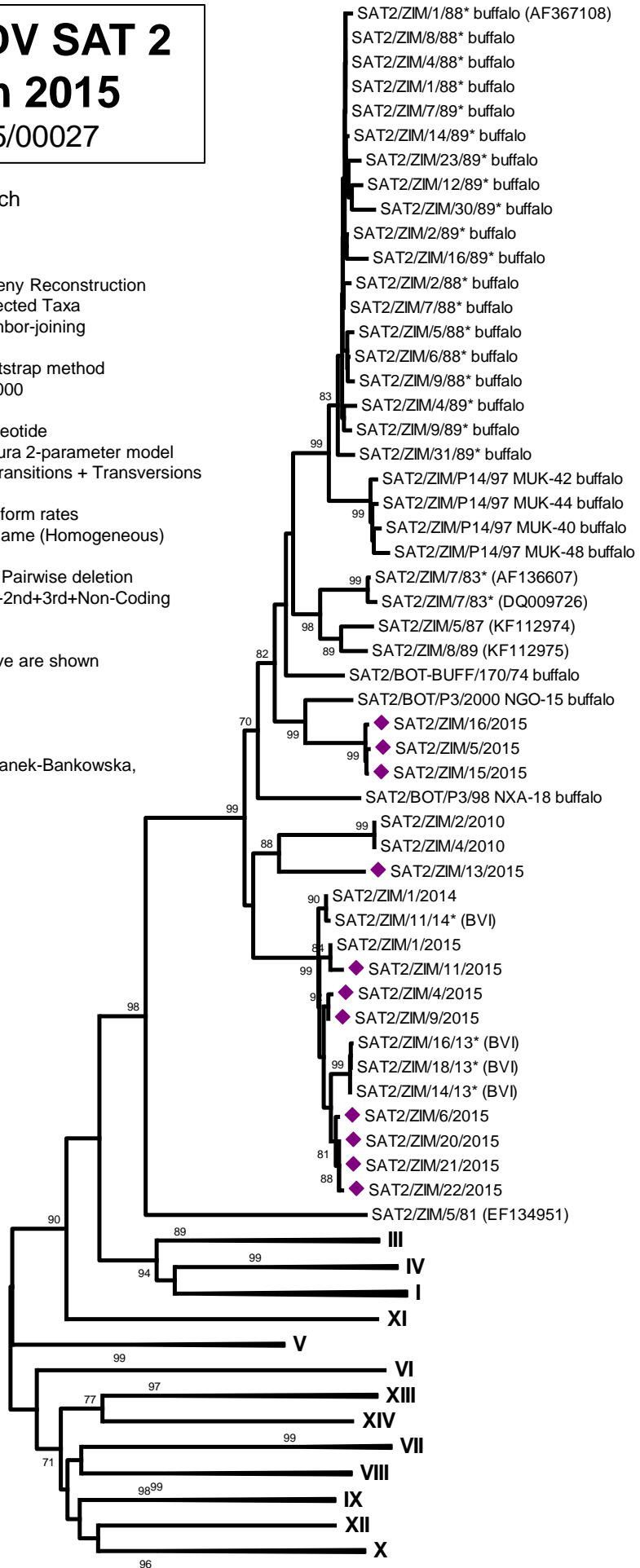
*, not a WRLFMD Ref. No.

N.J. Knowles, J. Wadsworth & K. Bachanek-Bankowska,

14 December 2015

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