



**INSTITUTE FOR ANIMAL HEALTH**

Director: Professor John Fazakerley BSc, MBA, PhD, FRCPath

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Ash Road,

Pirbright,

Surrey,

GU24 0NF

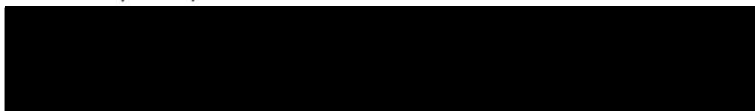
Intn Tel: 00 44 1483 232441

Tel: 01483 232441 Fax: 01483 232621

## FMD Genotyping Report

Lab Reference WRL Batch Number: WRLFMD/2012/00024

Sender Details:



Date Received: 29<sup>th</sup> June 2012

Country of Origin: Kenya

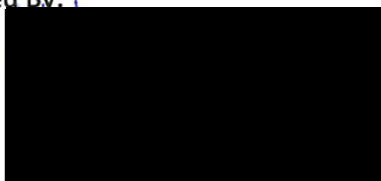
Date Reported: 18<sup>th</sup> July 2012

Dear Dr EC Chepkwony

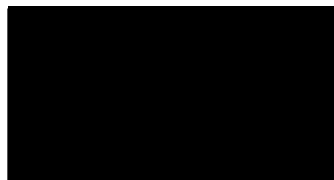
Sequencing work has now been completed in respect of the samples you submitted and the details are as attached. Please note that all of our phylogenetic trees can be accessed via the internet at:

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

Results Approved By:

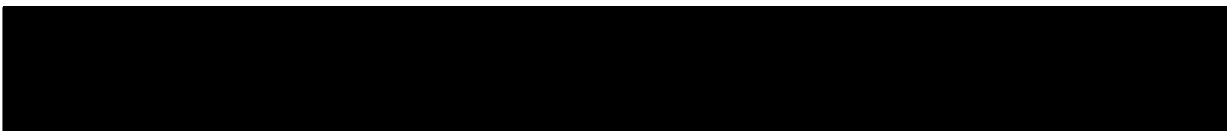


Official Stamp:



Date:

20/7/12



A UKAS accredited testing laboratory No. 4025.

To help us improve the quality of our service, please send any suggestions or requests to the Reference Laboratory by fax (+44 (0) 1483 232621 or email: [gareth.shimmon@iah.ac.uk](mailto:gareth.shimmon@iah.ac.uk). IAH actively seeks and appreciates feedback, if you would like to offer feedback please complete the WRLFMD survey here: <http://www.surveymonkey.com/s/WRLFMD>

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

## Genotyping Report

Report Date for this Batch: 18 July 2012

FMDV type SAT 2

Country: Kenya

Period: 2011

No. of samples: 6

BATCH: WRLFMD/2012/00024



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# FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: SAT2 WRLFMD Ref No: KEN/12/2011 Batch No: WRLFMD/2012/00024 Sender Ref: K57/11 Location: Karin, Ngong-Kasiado, Rift Valley, Kenya Date collected: 06/07/2011 Date received by WRLFMD: 29/06/2012 Date received for sequencing: 11/07/2012 Species: Cattle Material used: BTy1 Region sequenced: VP1 RT-PCR primers: SAT2-1C445F/SAT-2B208R SAT2-P1-1223F/SAT-2B208R	Report date: 17/07/2012 Reported by: N.J. Knowles Checked by: D.P. King Topotype: IV Genotype/strain: unnamed Sequence filename: KEN11-12.SEQ Date sequence last updated: 13/07/2012 No. of Nt determined: 648 No. of ambiguities: 0 Gene length: 648 Total no. of comparisons: 531 Min. no. of nt for comparison: 600 Total turn-around time: 18 days Sequencing time: 6 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/KEN/19/2011	KEN11-19	648	648	0	100.00	0.00	IV	unnamed
2	SAT2/KEN/21/2011	KEN11-21	648	647	0	99.85	0.15	IV	unnamed
3	SAT2/TAN/3/2011	TAN11-03	648	647	0	99.85	0.15	IV	unnamed
4	SAT2/TAN/4/2011	TAN11-04	648	647	0	99.85	0.15	IV	unnamed
5	SAT2/TAN/6/2011	TAN11-06	648	647	0	99.85	0.15	IV	unnamed
6	SAT2/KEN/20/2011	KEN11-20	648	646	0	99.69	0.31	IV	unnamed
7	SAT2/TAN/7/2011	TAN11-07	648	646	0	99.69	0.31	IV	unnamed
8	SAT2/TAN/8/2011	TAN11-08	648	646	0	99.69	0.31	IV	unnamed
9	SAT2/KEN/18/2011	KEN11-18	648	645	0	99.54	0.46	IV	unnamed
10	SAT2/KEN/17/2011	KEN11-17	648	644	0	99.38	0.62	IV	unnamed
Most Closely Related Reference Viruses									
(see <a href="http://www.wrlfmd.org/fmd_genotyping/prototypes.htm">http://www.wrlfmd.org/fmd_genotyping/prototypes.htm</a> )									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	564	0	87.04	12.96	IV	unnamed
2	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	551	0	85.03	14.97	IV	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	521	0	80.40	19.60	III	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	515	1	79.60	20.40	III	unnamed
5	SAT2/MAL/1/2003	MAL03-01	648	513	0	79.17	20.83	I	unnamed
6	SAT2/SA/106/59 (AY593848)	RSA59--A	648	508	0	78.40	21.60	I	unnamed
7	SAT2/ZIM/14/2002	ZIM02-14	648	508	0	78.40	21.60	I	unnamed
8	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	486	0	75.00	25.00	II	unnamed
9	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	485	0	74.85	25.15	II	unnamed
10	SAT2/RWA/1/2000* (AF367134)	RWA00-01	648	480	0	74.07	25.93	VIII	unnamed

nt, nucleotides

\*, not a WRLFMD reference number

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# FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: SAT2	Report date: 17/07/2012
WRLFMD Ref No: KEN/18/2011	Reported by: N.J. Knowles
Batch No: WRLFMD/2012/00024	Checked by: D.P. King
Sender Ref: K101/11	
Location: Murera Sisal, Ruiru, Central, Kenya	Topotype: IV
Date collected: 23/09/2011	Genotype/strain: unnamed
Date received by WRLFMD: 29/06/2012	Sequence filename: KEN11-18.SEQ
Date received for sequencing: 11/07/2012	Date sequence last updated: 13/07/2012
Species: Cattle	No. of Nt determined: 648
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 531
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 18 days
	Sequencing time: 6 days
Comments:	

<b>Most Closely Related Viruses</b>									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/12/2011	KEN11-12	648	645	0	99.54	0.46	IV	unnamed
2	SAT2/KEN/19/2011	KEN11-19	648	645	0	99.54	0.46	IV	unnamed
3	SAT2/KEN/21/2011	KEN11-21	648	644	0	99.38	0.62	IV	unnamed
4	SAT2/TAN/3/2011	TAN11-03	648	644	0	99.38	0.62	IV	unnamed
5	SAT2/TAN/4/2011	TAN11-04	648	644	0	99.38	0.62	IV	unnamed
6	SAT2/TAN/6/2011	TAN11-06	648	644	0	99.38	0.62	IV	unnamed
7	SAT2/KEN/20/2011	KEN11-20	648	643	0	99.23	0.77	IV	unnamed
8	SAT2/TAN/7/2011	TAN11-07	648	643	0	99.23	0.77	IV	unnamed
9	SAT2/TAN/8/2011	TAN11-08	648	643	0	99.23	0.77	IV	unnamed
10	SAT2/KEN/17/2011	KEN11-17	648	641	0	98.92	1.08	IV	unnamed
<b>Most Closely Related Reference Viruses</b>									
(see <a href="http://www.wrlfmd.org/fmd_genotyping/prototypes.htm">http://www.wrlfmd.org/fmd_genotyping/prototypes.htm</a> )									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	561	0	86.57	13.43	IV	unnamed
2	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	548	0	84.57	15.43	IV	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	518	0	79.94	20.06	III	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	514	1	79.44	20.56	III	unnamed
5	SAT2/MAL/1/2003	MAL03-01	648	512	0	79.01	20.99	I	unnamed
6	SAT2/SA/106/59 (AY593848)	RSA59--A	648	506	0	78.09	21.91	I	unnamed
7	SAT2/ZIM/14/2002	ZIM02-14	648	506	0	78.09	21.91	I	unnamed
8	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	485	0	74.85	25.15	II	unnamed
9	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	484	0	74.69	25.31	II	unnamed
10	SAT2/RWA/1/2000* (AF367134)	RWA00-01	648	479	0	73.92	26.08	VIII	unnamed

nt, nucleotides

\*, not a WRLFMD reference number

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# FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: SAT2	Report date: 17/07/2012
WRLFMD Ref No: KEN/19/2011	Reported by: N.J. Knowles
Batch No: WRLFMD/2012/00024	Checked by: D.P. King
Sender Ref: K108/11	
Location: Central, Naivasha, Rift Valley, Kenya	Topotype: IV
Date collected: 23/09/2011	Genotype/strain: unnamed
Date received by WRLFMD: 29/06/2012	Sequence filename: KEN11-19.SEQ
Date received for sequencing: 11/07/2012	Date sequence last updated: 13/07/2012
Species: Cattle	No. of Nt determined: 648
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 531
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 18 days
	Sequencing time: 6 days
Comments:	

<b>Most Closely Related Viruses</b>									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/12/2011	KEN11-12	648	648	0	100.00	0.00	IV	unnamed
2	SAT2/KEN/21/2011	KEN11-21	648	647	0	99.85	0.15	IV	unnamed
3	SAT2/TAN/3/2011	TAN11-03	648	647	0	99.85	0.15	IV	unnamed
4	SAT2/TAN/4/2011	TAN11-04	648	647	0	99.85	0.15	IV	unnamed
5	SAT2/TAN/6/2011	TAN11-06	648	647	0	99.85	0.15	IV	unnamed
6	SAT2/KEN/20/2011	KEN11-20	648	646	0	99.69	0.31	IV	unnamed
7	SAT2/TAN/7/2011	TAN11-07	648	646	0	99.69	0.31	IV	unnamed
8	SAT2/TAN/8/2011	TAN11-08	648	646	0	99.69	0.31	IV	unnamed
9	SAT2/KEN/18/2011	KEN11-18	648	645	0	99.54	0.46	IV	unnamed
10	SAT2/KEN/17/2011	KEN11-17	648	644	0	99.38	0.62	IV	unnamed
<b>Most Closely Related Reference Viruses</b>									
(see <a href="http://www.wrlfmd.org/fmd_genotyping/prototypes.htm">http://www.wrlfmd.org/fmd_genotyping/prototypes.htm</a> )									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	564	0	87.04	12.96	IV	unnamed
2	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	551	0	85.03	14.97	IV	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	521	0	80.40	19.60	III	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	515	1	79.60	20.40	III	unnamed
5	SAT2/MAL/1/2003	MAL03-01	648	513	0	79.17	20.83	I	unnamed
6	SAT2/SA/106/59 (AY593848)	RSA59--A	648	508	0	78.40	21.60	I	unnamed
7	SAT2/ZIM/14/2002	ZIM02-14	648	508	0	78.40	21.60	I	unnamed
8	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	486	0	75.00	25.00	II	unnamed
9	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	485	0	74.85	25.15	II	unnamed
10	SAT2/RWA/1/2000* (AF367134)	RWA00-01	648	480	0	74.07	25.93	VIII	unnamed

nt, nucleotides

\*, not a WRLFMD reference number

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# FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: SAT2	Report date: 17/07/2012
WRLFMD Ref No: KEN/20/2011	Reported by: N.J. Knowles
Batch No: WRLFMD/2012/00024	Checked by: D.P. King
Sender Ref: K112/11	
Location: Care, Mai-Mahiv, Rift Valley, Kenya	Topotype: IV
Date collected: 27/10/2011	Genotype/strain: unnamed
Date received by WRLFMD: 29/06/2012	Sequence filename: KEN11-20.SEQ
Date received for sequencing: 11/07/2012	Date sequence last updated: 13/07/2012
Species: Cattle	No. of Nt determined: 648
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 531
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 18 days
	Sequencing time: 6 days
Comments:	

<b>Most Closely Related Viruses</b>									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/12/2011	KEN11-12	648	646	0	99.69	0.31	IV	unnamed
2	SAT2/KEN/19/2011	KEN11-19	648	646	0	99.69	0.31	IV	unnamed
3	SAT2/KEN/21/2011	KEN11-21	648	645	0	99.54	0.46	IV	unnamed
4	SAT2/TAN/3/2011	TAN11-03	648	645	0	99.54	0.46	IV	unnamed
5	SAT2/TAN/4/2011	TAN11-04	648	645	0	99.54	0.46	IV	unnamed
6	SAT2/TAN/6/2011	TAN11-06	648	645	0	99.54	0.46	IV	unnamed
7	SAT2/TAN/7/2011	TAN11-07	648	644	0	99.38	0.62	IV	unnamed
8	SAT2/TAN/8/2011	TAN11-08	648	644	0	99.38	0.62	IV	unnamed
9	SAT2/KEN/18/2011	KEN11-18	648	643	0	99.23	0.77	IV	unnamed
10	SAT2/KEN/17/2011	KEN11-17	648	642	0	99.07	0.93	IV	unnamed
<b>Most Closely Related Reference Viruses</b>									
(see <a href="http://www.wrlfmd.org/fmd_genotyping/prototypes.htm">http://www.wrlfmd.org/fmd_genotyping/prototypes.htm</a> )									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	564	0	87.04	12.96	IV	unnamed
2	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	551	0	85.03	14.97	IV	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	520	0	80.25	19.75	III	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	516	1	79.75	20.25	III	unnamed
5	SAT2/MAL/1/2003	MAL03-01	648	513	0	79.17	20.83	I	unnamed
6	SAT2/ZIM/14/2002	ZIM02-14	648	508	0	78.40	21.60	I	unnamed
7	SAT2/SA/106/59 (AY593848)	RSA59--A	648	507	0	78.24	21.76	I	unnamed
8	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	486	0	75.00	25.00	II	unnamed
9	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	485	0	74.85	25.15	II	unnamed
10	SAT2/RWA/1/2000* (AF367134)	RWA00-01	648	480	0	74.07	25.93	VIII	unnamed

nt, nucleotides

\*, not a WRLFMD reference number

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# FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: SAT2	Report date: 17/07/2012
WRLFMD Ref No: KEN/21/2011	Reported by: N.J. Knowles
Batch No: WRLFMD/2012/00024	Checked by: D.P. King
Sender Ref: K114	
Location: Karati, Naivasha, Rift Valley, Kenya	Topotype: IV
Date collected: 27/10/2011	Genotype/strain: unnamed
Date received by WRLFMD: 29/06/2012	Sequence filename: KEN11-21.SEQ
Date received for sequencing: 11/07/2012	Date sequence last updated: 13/07/2012
Species: Cattle	No. of Nt determined: 648
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 648
RT-PCR primers: SAT2-1C445F/SAT-2B208R	Total no. of comparisons: 531
SAT2-P1-1223F/SAT-2B208R	Min. no. of nt for comparison: 600
	Total turn-around time: 18 days
	Sequencing time: 6 days
Comments:	

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Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/12/2011	KEN11-12	648	647	0	99.85	0.15	IV	unnamed
2	SAT2/KEN/19/2011	KEN11-19	648	647	0	99.85	0.15	IV	unnamed
3	SAT2/TAN/3/2011	TAN11-03	648	646	0	99.69	0.31	IV	unnamed
4	SAT2/TAN/4/2011	TAN11-04	648	646	0	99.69	0.31	IV	unnamed
5	SAT2/TAN/6/2011	TAN11-06	648	646	0	99.69	0.31	IV	unnamed
6	SAT2/KEN/20/2011	KEN11-20	648	645	0	99.54	0.46	IV	unnamed
7	SAT2/TAN/7/2011	TAN11-07	648	645	0	99.54	0.46	IV	unnamed
8	SAT2/TAN/8/2011	TAN11-08	648	645	0	99.54	0.46	IV	unnamed
9	SAT2/KEN/18/2011	KEN11-18	648	644	0	99.38	0.62	IV	unnamed
10	SAT2/KEN/17/2011	KEN11-17	648	643	0	99.23	0.77	IV	unnamed
<b>Most Closely Related Reference Viruses</b>									
(see <a href="http://www.wrlfmd.org/fmd_genotyping/prototypes.htm">http://www.wrlfmd.org/fmd_genotyping/prototypes.htm</a> )									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	SAT2/KEN/1/84 (K7/84) (AY344505)	KEN84-AB	648	564	0	87.04	12.96	IV	unnamed
2	SAT2/ETH/1/90 (1989)(AY343935)	ETH90-AA	648	551	0	85.03	14.97	IV	unnamed
3	SAT2/RHO/1/48 (AY593847)	ZAM48B01	648	520	0	80.25	19.75	III	unnamed
4	SAT2/BOT/P3/98 (buffalo 29) (AF367124)	BOT98-AC	647	515	1	79.60	20.40	III	unnamed
5	SAT2/MAL/1/2003	MAL03-01	648	513	0	79.17	20.83	I	unnamed
6	SAT2/SA/106/59 (AY593848)	RSA59--A	648	508	0	78.40	21.60	I	unnamed
7	SAT2/ZIM/14/2002	ZIM02-14	648	508	0	78.40	21.60	I	unnamed
8	SAT2/ZIM/5/81 (EF134951)	ZIM81-AA	648	486	0	75.00	25.00	II	unnamed
9	SAT2/ZIM/7/83 (AF136607)	ZIM83A07	648	485	0	74.85	25.15	II	unnamed
10	SAT2/GHA/2/90 (AF479415)	GHA90A02	648	479	0	73.92	26.08	V	unnamed

nt, nucleotides

\*, not a WRLFMD reference number

Assembled with Report Generator v4.1

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# Report on FMDV SAT 2 in Kenya in 2011

Batch: WRLFMD/2012/00024

◆ indicates viruses in this batch

Software: MEGA 5.0

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

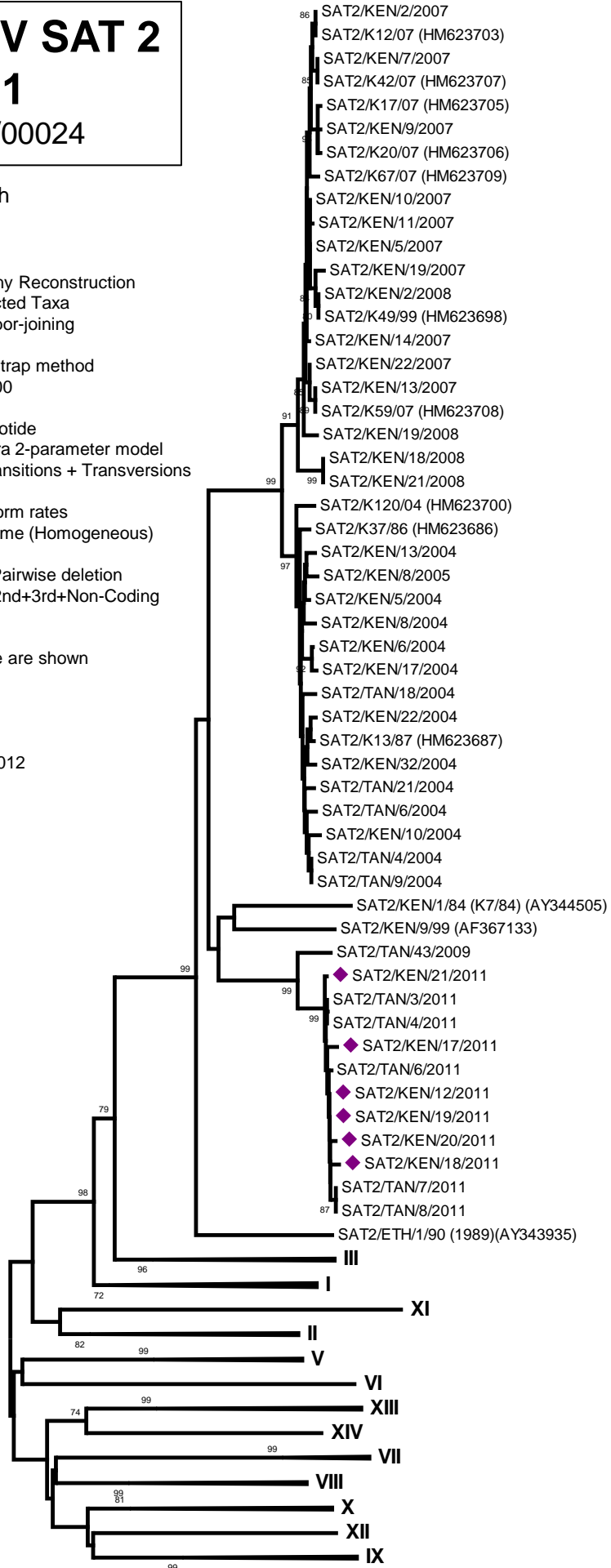
Only bootstrap values of 70% and above are shown

\*, not a WRLFMD Ref. No.

N.J. Knowles & J. Wadsworth, 18 July 2012

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IV

0.05