

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

Genotyping Report

Report Date for this Batch: 18 April 2016

FMDV type O

Country: Sudan

Period: 2012-2013

No. of samples: 6

BATCH: WRLFMD/2015/00038



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FAO World Reference Laboratory for FMD Genotyping Report

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

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Serotype: O	Report date: 07/04/2016
WRLFMD Ref No: SUD/1/2012	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00038	Checked by: K. Bachanek-Bankowska
Sender Ref: Feb/2012-R. Nile 2/5	
Location: River Nile, Northern, Sudan	Topotype: EA-3
Date collected: 01/02/2012	Genotype/strain: unnamed
Date received by WRLFMD: 03/12/2015	Sequence filename: SUD12-01.SEQ
Date received for sequencing: 18/03/2016	Date sequence last updated: 06/04/2016
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 06/03/2016	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 4284
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 126 days
	Sequencing time: 20 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/SUD/2/2012	SUD12-02	639	639	0	100.00	0.00	EA-3	unnamed
2	O/SUD/3/2012	SUD12-03	639	639	0	100.00	0.00	EA-3	unnamed
3	O/SUD/6/2012	SUD12-06	639	639	0	100.00	0.00	EA-3	unnamed
4	O/ERI/1/2011	ERI11-01	639	638	0	99.84	0.16	EA-3	unnamed
5	O/ERI/11/2011	ERI11-11	639	638	0	99.84	0.16	EA-3	unnamed
6	O/ERI/12/2011	ERI11-12	639	638	0	99.84	0.16	EA-3	unnamed
7	O/ERI/13/2011	ERI11-13	639	638	0	99.84	0.16	EA-3	unnamed
8	O/ERI/16/2011	ERI11-16	639	638	0	99.84	0.16	EA-3	unnamed
9	O/ERI/2/2011	ERI11-02	639	638	0	99.84	0.16	EA-3	unnamed
10	O/ERI/3/2011	ERI11-03	639	638	0	99.84	0.16	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	590	0	92.33	7.67	EA-3	unnamed
2	O/ETH/1/2007 (FJ798137)	ETH07-01	639	559	0	87.48	12.52	EA-3	unnamed
3	O/IND/53/79 (AF292107)	IND79A53	639	553	0	86.54	13.46	ME-SA	unnamed
4	O/MAL/1/98 (DQ165074)	MAL98-01	639	552	0	86.38	13.62	EA-2	unnamed
5	O/ETH/3/2004 (FJ798109)	ETH04-03	639	550	0	86.07	13.93	EA-3	unnamed
6	O/UGA/3/2002 (DQ165077)	UGA02-03	639	550	0	86.07	13.93	EA-2	unnamed
7	O/K83/79* (AJ303511)	KEN79B83	638	549	1	86.05	13.95	EA-1	unnamed
8	O/BHU/3/2009 (KM921814)	BHU09-03	639	548	0	85.76	14.24	ME-SA	Ind-2001d
9	O/TAN/2/2004 (KF561679)	TAN04-02	639	548	0	85.76	14.24	EA-2	unnamed
10	O/PAK/16/2010	PAK10-16	639	545	0	85.29	14.71	ME-SA	PanAsia-2 ^{PUN-10}

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O WRLFMD Ref No: SUD/2/2012 Batch No: WRLFMD/2015/00038 Sender Ref: Feb/2012-R. Nile 3/5 Location: River Nile, Northern, Sudan Date collected: 01/02/2012 Date received by WRLFMD: 03/12/2015 Date received for sequencing: 18/03/2016 Species: Cattle Material used: BTy1 06/03/2016 & BTy2 09/03/2016 Region sequenced: VP1 RT-PCR primers: O-1C244F/EUR-2B52R O-1C272F/EUR-2B52R	Report date: 07/04/2016 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: EA-3 Genotype/strain: unnamed Sequence filename: SUD12-02.SEQ Date sequence last updated: 06/04/2016 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 4284 Min. no. of nt for comparison: 600 Total turn-around time: 126 days Sequencing time: 20 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/SUD/1/2012	SUD12-01	639	639	0	100.00	0.00	EA-3	unnamed
2	O/SUD/3/2012	SUD12-03	639	639	0	100.00	0.00	EA-3	unnamed
3	O/SUD/6/2012	SUD12-06	639	639	0	100.00	0.00	EA-3	unnamed
4	O/ERI/1/2011	ERI11-01	639	638	0	99.84	0.16	EA-3	unnamed
5	O/ERI/11/2011	ERI11-11	639	638	0	99.84	0.16	EA-3	unnamed
6	O/ERI/12/2011	ERI11-12	639	638	0	99.84	0.16	EA-3	unnamed
7	O/ERI/13/2011	ERI11-13	639	638	0	99.84	0.16	EA-3	unnamed
8	O/ERI/16/2011	ERI11-16	639	638	0	99.84	0.16	EA-3	unnamed
9	O/ERI/2/2011	ERI11-02	639	638	0	99.84	0.16	EA-3	unnamed
10	O/ERI/3/2011	ERI11-03	639	638	0	99.84	0.16	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	590	0	92.33	7.67	EA-3	unnamed
2	O/ETH/1/2007 (FJ798137)	ETH07-01	639	559	0	87.48	12.52	EA-3	unnamed
3	O/IND/53/79 (AF292107)	IND79A53	639	553	0	86.54	13.46	ME-SA	unnamed
4	O/MAL/1/98 (DQ165074)	MAL98-01	639	552	0	86.38	13.62	EA-2	unnamed
5	O/ETH/3/2004 (FJ798109)	ETH04-03	639	550	0	86.07	13.93	EA-3	unnamed
6	O/UGA/3/2002 (DQ165077)	UGA02-03	639	550	0	86.07	13.93	EA-2	unnamed
7	O/K83/79* (AJ303511)	KEN79B83	638	549	1	86.05	13.95	EA-1	unnamed
8	O/BHU/3/2009 (KM921814)	BHU09-03	639	548	0	85.76	14.24	ME-SA	Ind-2001d
9	O/TAN/2/2004 (KF561679)	TAN04-02	639	548	0	85.76	14.24	EA-2	unnamed
10	O/PAK/16/2010	PAK10-16	639	545	0	85.29	14.71	ME-SA	PanAsia-2 ^{PUN-10}

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 07/04/2016
WRLFMD Ref No: SUD/3/2012	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00038	Checked by: K. Bachanek-Bankowska
Sender Ref: Feb/2012-R. Nile 2/7	
Location: River Nile, Northern, Sudan	Topotype: EA-3
Date collected: 01/02/2012	Genotype/strain: unnamed
Date received by WRLFMD: 03/12/2015	Sequence filename: SUD12-03.SEQ
Date received for sequencing: 18/03/2016	Date sequence last updated: 06/04/2016
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 10/03/2016	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 4284
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 126 days
	Sequencing time: 20 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/SUD/1/2012	SUD12-01	639	639	0	100.00	0.00	EA-3	unnamed
2	O/SUD/2/2012	SUD12-02	639	639	0	100.00	0.00	EA-3	unnamed
3	O/SUD/6/2012	SUD12-06	639	639	0	100.00	0.00	EA-3	unnamed
4	O/ERI/1/2011	ERI11-01	639	638	0	99.84	0.16	EA-3	unnamed
5	O/ERI/11/2011	ERI11-11	639	638	0	99.84	0.16	EA-3	unnamed
6	O/ERI/12/2011	ERI11-12	639	638	0	99.84	0.16	EA-3	unnamed
7	O/ERI/13/2011	ERI11-13	639	638	0	99.84	0.16	EA-3	unnamed
8	O/ERI/16/2011	ERI11-16	639	638	0	99.84	0.16	EA-3	unnamed
9	O/ERI/2/2011	ERI11-02	639	638	0	99.84	0.16	EA-3	unnamed
10	O/ERI/3/2011	ERI11-03	639	638	0	99.84	0.16	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	590	0	92.33	7.67	EA-3	unnamed
2	O/ETH/1/2007 (FJ798137)	ETH07-01	639	559	0	87.48	12.52	EA-3	unnamed
3	O/IND/53/79 (AF292107)	IND79A53	639	553	0	86.54	13.46	ME-SA	unnamed
4	O/MAL/1/98 (DQ165074)	MAL98-01	639	552	0	86.38	13.62	EA-2	unnamed
5	O/ETH/3/2004 (FJ798109)	ETH04-03	639	550	0	86.07	13.93	EA-3	unnamed
6	O/UGA/3/2002 (DQ165077)	UGA02-03	639	550	0	86.07	13.93	EA-2	unnamed
7	O/K83/79* (AJ303511)	KEN79B83	638	549	1	86.05	13.95	EA-1	unnamed
8	O/BHU/3/2009 (KM921814)	BHU09-03	639	548	0	85.76	14.24	ME-SA	Ind-2001d
9	O/TAN/2/2004 (KF561679)	TAN04-02	639	548	0	85.76	14.24	EA-2	unnamed
10	O/PAK/16/2010	PAK10-16	639	545	0	85.29	14.71	ME-SA	PanAsia-2 ^{PUN-10}

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 07/04/2016
WRLFMD Ref No: SUD/5/2012	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00038	Checked by: K. Bachanek-Bankowska
Sender Ref: Feb/2012-R. Nile 4/7	
Location: River Nile, Northern, Sudan	Topotype: EA-3
Date collected: 01/02/2012	Genotype/strain: unnamed
Date received by WRLFMD: 03/12/2015	Sequence filename: SUD12-05.SEQ
Date received for sequencing: 18/03/2016	Date sequence last updated: 06/04/2016
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 09/03/2016	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 4284
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 126 days
	Sequencing time: 20 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/SUD/1/2012	SUD12-01	639	638	0	99.84	0.16	EA-3	unnamed
2	O/SUD/2/2012	SUD12-02	639	638	0	99.84	0.16	EA-3	unnamed
3	O/SUD/3/2012	SUD12-03	639	638	0	99.84	0.16	EA-3	unnamed
4	O/SUD/6/2012	SUD12-06	639	638	0	99.84	0.16	EA-3	unnamed
5	O/ERI/1/2011	ERI11-01	639	637	0	99.69	0.31	EA-3	unnamed
6	O/ERI/11/2011	ERI11-11	639	637	0	99.69	0.31	EA-3	unnamed
7	O/ERI/12/2011	ERI11-12	639	637	0	99.69	0.31	EA-3	unnamed
8	O/ERI/13/2011	ERI11-13	639	637	0	99.69	0.31	EA-3	unnamed
9	O/ERI/16/2011	ERI11-16	639	637	0	99.69	0.31	EA-3	unnamed
10	O/ERI/2/2011	ERI11-02	639	637	0	99.69	0.31	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	589	0	92.18	7.82	EA-3	unnamed
2	O/ETH/1/2007 (FJ798137)	ETH07-01	639	558	0	87.32	12.68	EA-3	unnamed
3	O/MAL/1/98 (DQ165074)	MAL98-01	639	553	0	86.54	13.46	EA-2	unnamed
4	O/IND/53/79 (AF292107)	IND79A53	639	552	0	86.38	13.62	ME-SA	unnamed
5	O/ETH/3/2004 (FJ798109)	ETH04-03	639	551	0	86.23	13.77	EA-3	unnamed
6	O/UGA/3/2002 (DQ165077)	UGA02-03	639	551	0	86.23	13.77	EA-2	unnamed
7	O/TAN/2/2004 (KF561679)	TAN04-02	639	549	0	85.92	14.08	EA-2	unnamed
8	O/K83/79* (AJ303511)	KEN79B83	638	548	1	85.89	14.11	EA-1	unnamed
9	O/BHU/3/2009 (KM921814)	BHU09-03	639	547	0	85.60	14.40	ME-SA	Ind-2001d
10	O/KEN/5/2002 (DQ165073)	KEN02-05	639	545	0	85.29	14.71	EA-2	unnamed

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O WRLFMD Ref No: SUD/6/2012 Batch No: WRLFMD/2015/00038 Sender Ref: Feb/2012-R. Nile 2/11 Location: River Nile, Northern, Sudan Date collected: 01/02/2012 Date received by WRLFMD: 03/12/2015 Date received for sequencing: 18/03/2016 Species: Cattle Material used: BTy1 09/03/2016 & BTy2 11/03/2016 Region sequenced: VP1 RT-PCR primers: O-1C244F/EUR-2B52R O-1C272F/EUR-2B52R	Report date: 07/04/2016 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: EA-3 Genotype/strain: unnamed Sequence filename: SUD12-06.SEQ Date sequence last updated: 06/04/2016 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 4284 Min. no. of nt for comparison: 600 Total turn-around time: 126 days Sequencing time: 20 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/SUD/1/2012	SUD12-01	639	639	0	100.00	0.00	EA-3	unnamed
2	O/SUD/2/2012	SUD12-02	639	639	0	100.00	0.00	EA-3	unnamed
3	O/SUD/3/2012	SUD12-03	639	639	0	100.00	0.00	EA-3	unnamed
4	O/ERI/1/2011	ERI11-01	639	638	0	99.84	0.16	EA-3	unnamed
5	O/ERI/11/2011	ERI11-11	639	638	0	99.84	0.16	EA-3	unnamed
6	O/ERI/12/2011	ERI11-12	639	638	0	99.84	0.16	EA-3	unnamed
7	O/ERI/13/2011	ERI11-13	639	638	0	99.84	0.16	EA-3	unnamed
8	O/ERI/16/2011	ERI11-16	639	638	0	99.84	0.16	EA-3	unnamed
9	O/ERI/2/2011	ERI11-02	639	638	0	99.84	0.16	EA-3	unnamed
10	O/ERI/3/2011	ERI11-03	639	638	0	99.84	0.16	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	590	0	92.33	7.67	EA-3	unnamed
2	O/ETH/1/2007 (FJ798137)	ETH07-01	639	559	0	87.48	12.52	EA-3	unnamed
3	O/IND/53/79 (AF292107)	IND79A53	639	553	0	86.54	13.46	ME-SA	unnamed
4	O/MAL/1/98 (DQ165074)	MAL98-01	639	552	0	86.38	13.62	EA-2	unnamed
5	O/ETH/3/2004 (FJ798109)	ETH04-03	639	550	0	86.07	13.93	EA-3	unnamed
6	O/UGA/3/2002 (DQ165077)	UGA02-03	639	550	0	86.07	13.93	EA-2	unnamed
7	O/K83/79* (AJ303511)	KEN79B83	638	549	1	86.05	13.95	EA-1	unnamed
8	O/BHU/3/2009 (KM921814)	BHU09-03	639	548	0	85.76	14.24	ME-SA	Ind-2001d
9	O/TAN/2/2004 (KF561679)	TAN04-02	639	548	0	85.76	14.24	EA-2	unnamed
10	O/PAK/16/2010	PAK10-16	639	545	0	85.29	14.71	ME-SA	PanAsia-2 ^{PUN-10}

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O WRLFMD Ref No: SUD/4/2013 Batch No: WRLFMD/2015/00038 Sender Ref: Gez 2 Location: not known, Sudan Date collected: 30/12/2013 Date received by WRLFMD: 03/12/2015 Date received for sequencing: 24/03/2016 Species: Cattle Material used: BTy1 12/03/2016 & BTy2 15/03/2016 Region sequenced: VP1 RT-PCR primers: O-1C244F/EUR-2B52R O-1C272F/EUR-2B52R	Report date: 12/04/2016 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: EA-3 Genotype/strain: unnamed Sequence filename: SUD13-04.SEQ Date sequence last updated: 12/04/2016 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 4284 Min. no. of nt for comparison: 600 Total turn-around time: 131 days Sequencing time: 19 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/ERI/8/2011	ERI11-08	639	599	0	93.74	6.26	EA-3	unnamed
2	O/SUD/1/2012	SUD12-01	639	599	0	93.74	6.26	EA-3	unnamed
3	O/SUD/2/2012	SUD12-02	639	599	0	93.74	6.26	EA-3	unnamed
4	O/SUD/3/2012	SUD12-03	639	599	0	93.74	6.26	EA-3	unnamed
5	O/SUD/6/2012	SUD12-06	639	599	0	93.74	6.26	EA-3	unnamed
6	O/EGY/19/2012	EGY12-19	639	598	0	93.58	6.42	EA-3	unnamed
7	O/ERI/1/2011	ERI11-01	639	598	0	93.58	6.42	EA-3	unnamed
8	O/ERI/11/2011	ERI11-11	639	598	0	93.58	6.42	EA-3	unnamed
9	O/ERI/12/2011	ERI11-12	639	598	0	93.58	6.42	EA-3	unnamed
10	O/ERI/13/2011	ERI11-13	639	598	0	93.58	6.42	EA-3	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	O/SUD/2/86 (DQ165075)	SUD86-02	639	568	0	88.89	11.11	EA-3	unnamed
2	O/ETH/3/2004 (FJ798109)	ETH04-03	639	547	0	85.60	14.40	EA-3	unnamed
3	O/ETH/1/2007 (FJ798137)	ETH07-01	639	546	0	85.45	14.55	EA-3	unnamed
4	O/IND/53/79 (AF292107)	IND79A53	639	539	0	84.35	15.65	ME-SA	unnamed
5	O/UGA/3/2002 (DQ165077)	UGA02-03	639	538	0	84.19	15.81	EA-2	unnamed
6	O/IRN/31/2009	IRN09-31	639	536	0	83.88	16.12	ME-SA	PanAsia-2 ^{FAR-09}
7	O/KUW/3/97 (DQ164904)	KUW97-03	639	535	0	83.72	16.28	ME-SA	Ind-2001a
8	O/MAL/1/98 (DQ165074)	MAL98-01	639	535	0	83.72	16.28	EA-2	unnamed
9	O/PAK/16/2010	PAK10-16	639	534	0	83.57	16.43	ME-SA	PanAsia-2 ^{PUN-10}
10	O/UKG/35/2001 (AJ539141)	UKG01-35	639	534	0	83.57	16.43	ME-SA	PanAsia

nt, nucleotides

*, not a WRLFMD reference number

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Report on FMDV O in Sudan in 2013-2014

Batch: WRLFMD/2016/00038

◆ indicates viruses in this batch

Software: MEGA 6.06

Analysis

Analysis ----- Phylogeny Reconstruction

Scope ----- All Selected Taxa

Statistical Method ----- Neighbor-joining

Phylogeny Test

Test of Phylogeny ----- Bootstrap method

No. of Bootstrap Replications ----- 1000

Substitution Model

Substitutions Type ----- Nucleotide

Model/Method ----- Kimura 2-parameter model

Substitutions to Include ----- d: Transitions + Transversions

Rates and Patterns

Rates among Sites ----- Uniform rates

Pattern among Lineages ----- Same (Homogeneous)

Data Subset to Use

Gaps/Missing Data Treatment ----- Pairwise deletion

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

No. of Sites : 642

No Of Bootstrap Reps = 1000

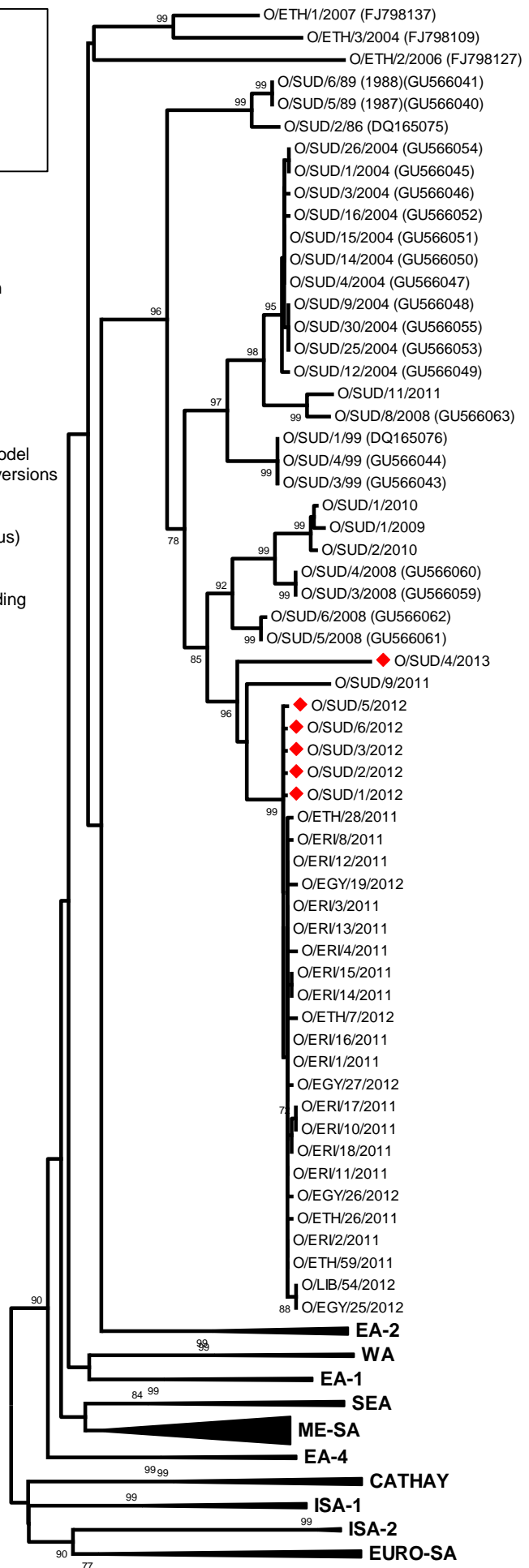
Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

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