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FMD Genotyping Report

Lab Reference WRL Batch Number: WRLFMD/2012/00028

Sender Details:

Date Received: 20th July 2012
Country of Origin: Sudan
Date Reported: 6th September 2012

Dear Dr Mohamed Habiela Ahmed,

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:

14/9/12

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: trish.ryder@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: 3 September 2012

FMDV type A

Country: Sudan

Period: 2011

No. of samples: 5

BATCH: WRLFMD/2012/00028



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FAO World Reference Laboratory for FMD Genotyping Report

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Serotype: A WRLFMD Ref No: SUD/1/2011 Batch No: WRLFMD/2012/00028 Sender Ref: 1/2011 Location: Keriab, Khartoum North, Khartoum, Sudan Date collected: 28/02/2011 Date received by WRLFMD: 20/07/2012 Date received for sequencing: 28/08/2012 Species: Cattle Material used: BTy1 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 03/09/2012 Reported by: N.J. Knowles Checked by: D.P. King Topotype: AFRICA Genotype/strain: G-IV Sequence filename: SUD11A01.SEQ Date sequence last updated: 30/08/2012 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 1439 Min. no. of nt for comparison: 600 Total turn-around time: 45 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	A/SUD/6/2011	SUD11-06	639	634	0	99.22	0.78	AFRICA	G-IV
2	A/SUD/7/2011	SUD11A07	639	633	0	99.06	0.94	AFRICA	G-IV
3	A/SUD/13/2011	SUD11-13	639	632	0	98.90	1.10	AFRICA	G-IV
4	A/SUD/12/2011	SUD11A12	639	631	0	98.75	1.25	AFRICA	G-IV
5	A/EGY/1/2012	EGY12-01	639	621	0	97.18	2.82	AFRICA	G-IV
6	A/EGY-B-2012*	EGY12-AB	639	621	0	97.18	2.82	AFRICA	G-IV
7	A/EGY-5-2012*	EGY12-AC	639	618	0	96.71	3.29	AFRICA	G-IV
8	A/ERI/1/2006	ERI06-01	639	604	0	94.52	5.48	AFRICA	G-IV
9	A/SUD/3/2006 (GU566070)	SUD06-03	639	604	0	94.52	5.48	AFRICA	G-IV
10	A/ERI/1/2008	ERI08-01	639	603	0	94.37	5.63	AFRICA	G-IV
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	A/SUD/3/77 (GU566064)	SUD77-03	639	554	0	86.70	13.30	AFRICA	G-IV
2	A/GHA/16/73	GHA73-16	636	538	0	84.59	15.41	AFRICA	G-VI
3	A/KEN/42/66 (K18/66)	KEN66-42	639	537	0	84.04	15.96	AFRICA	G-I
4	A21/Lumbwa/KEN/64 (AY593761)	KEN64-AA	639	536	0	83.88	16.12	AFRICA	G-III
5	A/NGR/2/73	NGR73-02	639	535	0	83.72	16.28	AFRICA	G-V
6	A/UGA/13/66	UGA66-13	639	533	0	83.41	16.59	AFRICA	G-VII
7	A/EGY/1/72 (EF208756)	EGY72-01	639	524	0	82.00	18.00	AFRICA	G-II
8	A12/UK/119/32 (M10975)	UKG32119	639	522	0	81.69	18.31	EURO-SA	A ₁₂
9	A23/Kitale/KEN/64 (AY593766)	KEN64-AB	639	516	0	80.75	19.25	AFRICA	G-VIII
10	A5/Allier/FRA/60 (AY593780)	FRA60--F	636	513	0	80.66	19.34	EURO-SA	A ₅

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: A WRLFMD Ref No: SUD/6/2011 Batch No: WRLFMD/2012/00028 Sender Ref: 14/2011 Location: Hilat Kuku, Khartoum North, Khartoum, Sudan Date collected: 01/03/2011 Date received by WRLFMD: 20/07/2012 Date received for sequencing: 28/08/2012 Species: Cattle Material used: BTy2 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 03/09/2012 Reported by: N.J. Knowles Checked by: D.P. King Topotype: AFRICA Genotype/strain: G-IV Sequence filename: SUD11-06.SEQ Date sequence last updated: 30/08/2012 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 1439 Min. no. of nt for comparison: 600 Total turn-around time: 45 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	A/SUD/7/2011	SUD11A07	639	638	0	99.84	0.16	AFRICA	G-IV
2	A/SUD/13/2011	SUD11-13	639	637	0	99.69	0.31	AFRICA	G-IV
3	A/SUD/12/2011	SUD11A12	639	636	0	99.53	0.47	AFRICA	G-IV
4	A/SUD/1/2011	SUD11A01	639	634	0	99.22	0.78	AFRICA	G-IV
5	A/EGY/1/2012	EGY12-01	639	626	0	97.97	2.03	AFRICA	G-IV
6	A/EGY-B-2012*	EGY12-AB	639	626	0	97.97	2.03	AFRICA	G-IV
7	A/EGY-5-2012*	EGY12-AC	639	623	0	97.50	2.50	AFRICA	G-IV
8	A/ERI/1/2006	ERI06-01	639	605	0	94.68	5.32	AFRICA	G-IV
9	A/SUD/3/2006 (GU566070)	SUD06-03	639	605	0	94.68	5.32	AFRICA	G-IV
10	A/ERI/1/2008	ERI08-01	639	604	0	94.52	5.48	AFRICA	G-IV

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	A/SUD/3/77 (GU566064)	SUD77-03	639	552	0	86.38	13.62	AFRICA	G-IV
2	A/GHA/16/73	GHA73-16	636	538	0	84.59	15.41	AFRICA	G-VI
3	A21/Lumbwa/KEN/64 (AY593761)	KEN64-AA	639	536	0	83.88	16.12	AFRICA	G-III
4	A/KEN/42/66 (K18/66)	KEN66-42	639	535	0	83.72	16.28	AFRICA	G-I
5	A/NGR/2/73	NGR73-02	639	535	0	83.72	16.28	AFRICA	G-V
6	A/UGA/13/66	UGA66-13	639	533	0	83.41	16.59	AFRICA	G-VII
7	A/EGY/1/72 (EF208756)	EGY72-01	639	522	0	81.69	18.31	AFRICA	G-II
8	A12/UK/119/32 (M10975)	UKG32119	639	522	0	81.69	18.31	EURO-SA	A ₁₂
9	A23/Kitale/KEN/64 (AY593766)	KEN64-AB	639	517	0	80.91	19.09	AFRICA	G-VIII
10	A5/Allier/FRA/60 (AY593780)	FRA60--F	636	512	0	80.50	19.50	EURO-SA	A ₅

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: A WRLFMD Ref No: SUD/7/2011 Batch No: WRLFMD/2012/00028 Sender Ref: 18/2011 Location: Shigla, Khartoum North, Khartoum, Sudan Date collected: 01/03/2011 Date received by WRLFMD: 20/07/2012 Date received for sequencing: 28/08/2012 Species: Cattle Material used: BTy1 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 03/09/2012 Reported by: N.J. Knowles Checked by: D.P. King Topotype: AFRICA Genotype/strain: G-IV Sequence filename: SUD11A07.SEQ Date sequence last updated: 30/08/2012 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 1439 Min. no. of nt for comparison: 600 Total turn-around time: 45 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	A/SUD/13/2011	SUD11-13	639	638	0	99.84	0.16	AFRICA	G-IV
2	A/SUD/6/2011	SUD11-06	639	638	0	99.84	0.16	AFRICA	G-IV
3	A/SUD/12/2011	SUD11A12	639	637	0	99.69	0.31	AFRICA	G-IV
4	A/SUD/1/2011	SUD11A01	639	633	0	99.06	0.94	AFRICA	G-IV
5	A/EGY/1/2012	EGY12-01	639	627	0	98.12	1.88	AFRICA	G-IV
6	A/EGY-B-2012*	EGY12-AB	639	627	0	98.12	1.88	AFRICA	G-IV
7	A/EGY-5-2012*	EGY12-AC	639	624	0	97.65	2.35	AFRICA	G-IV
8	A/ERI/1/2006	ERI06-01	639	606	0	94.84	5.16	AFRICA	G-IV
9	A/SUD/3/2006 (GU566070)	SUD06-03	639	606	0	94.84	5.16	AFRICA	G-IV
10	A/ERI/1/2008	ERI08-01	639	605	0	94.68	5.32	AFRICA	G-IV
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	A/SUD/3/77 (GU566064)	SUD77-03	639	551	0	86.23	13.77	AFRICA	G-IV
2	A/GHA/16/73	GHA73-16	636	537	0	84.43	15.57	AFRICA	G-VI
3	A/NGR/2/73	NGR73-02	639	535	0	83.72	16.28	AFRICA	G-V
4	A21/Lumbwa/KEN/64 (AY593761)	KEN64-AA	639	535	0	83.72	16.28	AFRICA	G-III
5	A/KEN/42/66 (K18/66)	KEN66-42	639	534	0	83.57	16.43	AFRICA	G-I
6	A/UGA/13/66	UGA66-13	639	532	0	83.26	16.74	AFRICA	G-VII
7	A/EGY/1/72 (EF208756)	EGY72-01	639	521	0	81.53	18.47	AFRICA	G-II
8	A12/UK/119/32 (M10975)	UKG32119	639	521	0	81.53	18.47	EURO-SA	A ₁₂
9	A23/Kitale/KEN/64 (AY593766)	KEN64-AB	639	517	0	80.91	19.09	AFRICA	G-VIII
10	A5/Allier/FRA/60 (AY593780)	FRA60--F	636	511	0	80.35	19.65	EURO-SA	A ₅

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: A	Report date: 03/09/2012
WRLFMD Ref No: SUD/12/2011	Reported by: N.J. Knowles
Batch No: WRLFMD/2012/00028	Checked by: D.P. King
Sender Ref: 31/2011	
Location: Sarha, Omdurman, Khartoum, Sudan	Topotype: AFRICA
Date collected: 03/03/2011	Genotype/strain: G-IV
Date received by WRLFMD: 20/07/2012	Sequence filename: SUD11A12.SEQ
Date received for sequencing: 28/08/2012	Date sequence last updated: 03/09/2012
Species: Cattle	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Total no. of comparisons: 1439
	Min. no. of nt for comparison: 600
	Total turn-around time: 45 days
	Sequencing time: 6 days
Comments: Originally typed as FMDV O, RT-PCR and sequencing showed this to be type A.	

Most Closely Related Viruses

Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/SUD/13/2011	SUD11-13	639	638	0	99.84	0.16	AFRICA	G-IV
2	A/SUD/7/2011	SUD11A07	639	637	0	99.69	0.31	AFRICA	G-IV
3	A/SUD/6/2011	SUD11-06	639	636	0	99.53	0.47	AFRICA	G-IV
4	A/SUD/1/2011	SUD11A01	639	631	0	98.75	1.25	AFRICA	G-IV
5	A/EGY/1/2012	EGY12-01	639	627	0	98.12	1.88	AFRICA	G-IV
6	A/EGY-B-2012*	EGY12-AB	639	627	0	98.12	1.88	AFRICA	G-IV
7	A/EGY-5-2012*	EGY12-AC	639	624	0	97.65	2.35	AFRICA	G-IV
8	A/ERI/1/2006	ERI06-01	639	606	0	94.84	5.16	AFRICA	G-IV
9	A/SUD/3/2006 (GU566070)	SUD06-03	639	606	0	94.84	5.16	AFRICA	G-IV
10	A/ERI/1/2008	ERI08-01	639	605	0	94.68	5.32	AFRICA	G-IV

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	A/SUD/3/77 (GU566064)	SUD77-03	639	551	0	86.23	13.77	AFRICA	G-IV
2	A/GHA/16/73	GHA73-16	636	539	0	84.75	15.25	AFRICA	G-VI
3	A21/Lumbwa/KEN/64 (AY593761)	KEN64-AA	639	536	0	83.88	16.12	AFRICA	G-III
4	A/NGR/2/73	NGR73-02	639	535	0	83.72	16.28	AFRICA	G-V
5	A/KEN/42/66 (K18/66)	KEN66-42	639	534	0	83.57	16.43	AFRICA	G-I
6	A/UGA/13/66	UGA66-13	639	534	0	83.57	16.43	AFRICA	G-VII
7	A12/UK/119/32 (M10975)	UKG32119	639	522	0	81.69	18.31	EURO-SA	A ₁₂
8	A/EGY/1/72 (EF208756)	EGY72-01	639	520	0	81.38	18.62	AFRICA	G-II
9	A23/Kitale/KEN/64 (AY593766)	KEN64-AB	639	518	0	81.06	18.94	AFRICA	G-VIII
10	A5/Allier/FRA/60 (AY593780)	FRA60--F	636	512	0	80.50	19.50	EURO-SA	A ₅

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: A WRLFMD Ref No: SUD/13/2011 Batch No: WRLFMD/2012/00028 Sender Ref: 38/2011 Location: Mwelaih, Omdurman, Khartoum, Sudan Date collected: 03/03/2011 Date received by WRLFMD: 20/07/2012 Date received for sequencing: 28/08/2012 Species: Cattle Material used: RS2 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 03/09/2012 Reported by: N.J. Knowles Checked by: D.P. King Topotype: AFRICA Genotype/strain: G-IV Sequence filename: SUD11-13.SEQ Date sequence last updated: 30/08/2012 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 1439 Min. no. of nt for comparison: 600 Total turn-around time: 45 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	A/SUD/12/2011	SUD11A12	639	638	0	99.84	0.16	AFRICA	G-IV
2	A/SUD/7/2011	SUD11A07	639	638	0	99.84	0.16	AFRICA	G-IV
3	A/SUD/6/2011	SUD11-06	639	637	0	99.69	0.31	AFRICA	G-IV
4	A/SUD/1/2011	SUD11A01	639	632	0	98.90	1.10	AFRICA	G-IV
5	A/EGY/1/2012	EGY12-01	639	628	0	98.28	1.72	AFRICA	G-IV
6	A/EGY-B-2012*	EGY12-AB	639	628	0	98.28	1.72	AFRICA	G-IV
7	A/EGY-5-2012*	EGY12-AC	639	625	0	97.81	2.19	AFRICA	G-IV
8	A/ERI/1/2006	ERI06-01	639	607	0	94.99	5.01	AFRICA	G-IV
9	A/SUD/3/2006 (GU566070)	SUD06-03	639	607	0	94.99	5.01	AFRICA	G-IV
10	A/ERI/1/2008	ERI08-01	639	606	0	94.84	5.16	AFRICA	G-IV
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	A/SUD/3/77 (GU566064)	SUD77-03	639	550	0	86.07	13.93	AFRICA	G-IV
2	A/GHA/16/73	GHA73-16	636	538	0	84.59	15.41	AFRICA	G-VI
3	A/NGR/2/73	NGR73-02	639	536	0	83.88	16.12	AFRICA	G-V
4	A21/Lumbwa/KEN/64 (AY593761)	KEN64-AA	639	535	0	83.72	16.28	AFRICA	G-III
5	A/KEN/42/66 (K18/66)	KEN66-42	639	533	0	83.41	16.59	AFRICA	G-I
6	A/UGA/13/66	UGA66-13	639	533	0	83.41	16.59	AFRICA	G-VII
7	A/EGY/1/72 (EF208756)	EGY72-01	639	521	0	81.53	18.47	AFRICA	G-II
8	A12/UK/119/32 (M10975)	UKG32119	639	521	0	81.53	18.47	EURO-SA	A ₁₂
9	A23/Kitale/KEN/64 (AY593766)	KEN64-AB	639	517	0	80.91	19.09	AFRICA	G-VIII
10	A5/Allier/FRA/60 (AY593780)	FRA60--F	636	511	0	80.35	19.65	EURO-SA	A ₅

nt, nucleotides

*, not a WRLFMD reference number

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Report on FMDV A in Sudan in 2011

Batch: WRLFMD/2012/00028

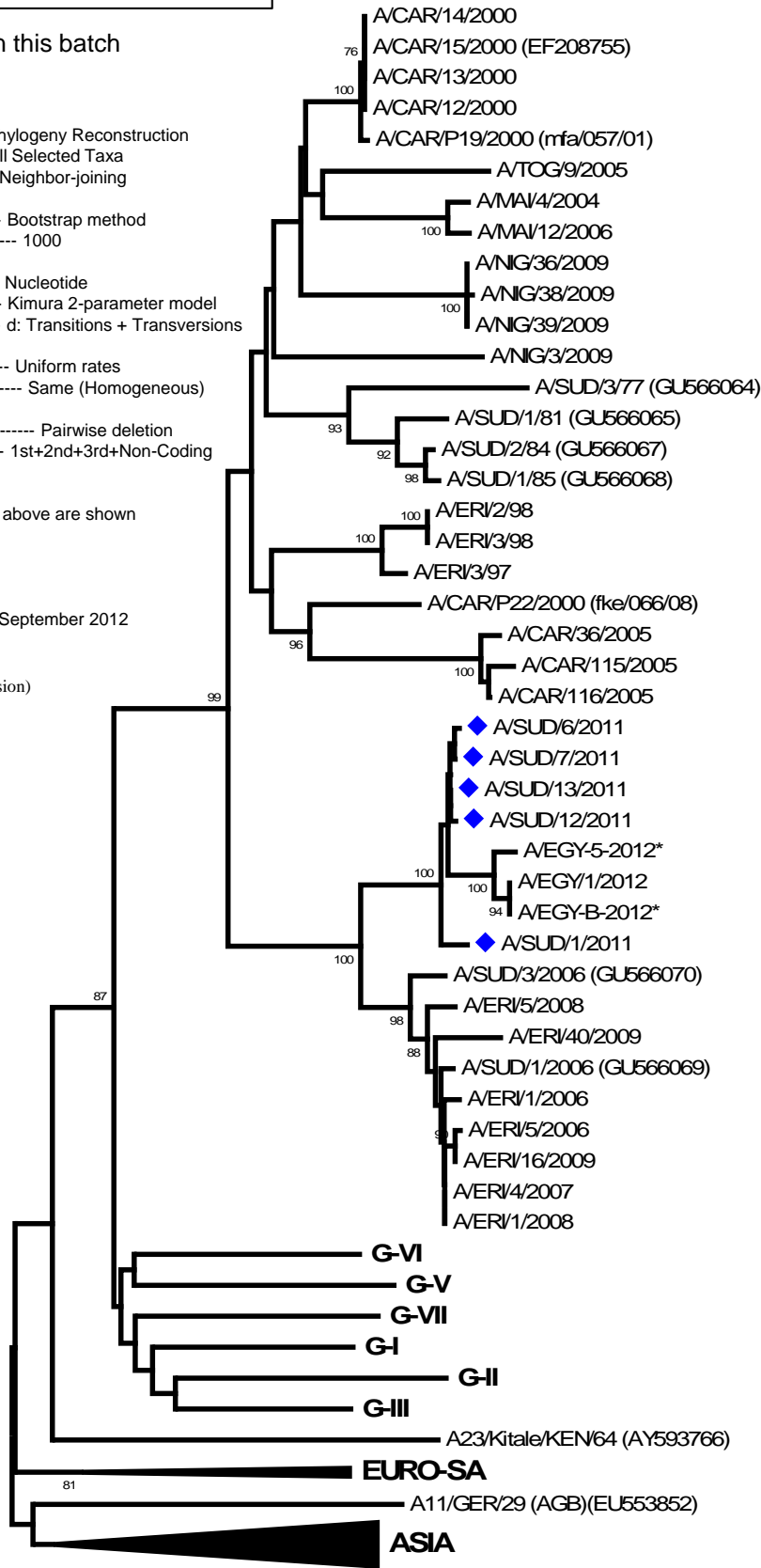
◆ indicates viruses in this batch

Software: MEGA 5.0
 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 : 639
 No Of Bootstrap Reps = 1000
 Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

N.J. Knowles & J. Wadsworth, 03 September 2012

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0.02