

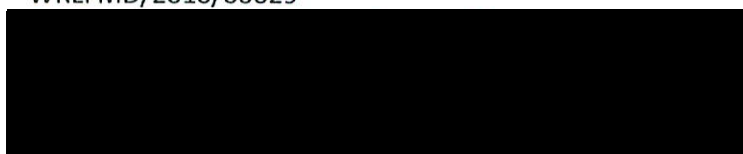


INSTITUTE FOR ANIMAL HEALTH
Director: Professor Martin W. Shirley, PhD
PIRBRIGHT LABORATORY
Ash Road,
Pirbright,
Surrey,
GU24 0NF
Intn Tel: 00 44 1483 232441
Tel: 01483 232441 Fax: 01483 232621

FMD Sequencing Report

Lab Reference WRL Batch Number: WRLFMD/2010/00029

Sender Details:



Date Received: 31st August 2010

Country of Origin: Pakistan

Date Reported: 8th October 2010

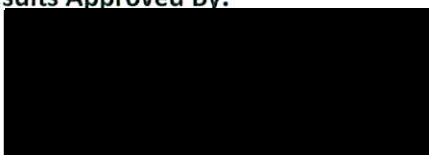
Dear Dr. Ehtisham Khan,

Re.: Serotype O

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:

8/10/10



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: elizabeth.wilson@bbsrc.ac.uk)

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

Genotyping Report

Report Date for this Batch: 7 October 2010

FMDV type O

Country: Pakistan

Period: 2010

No. of isolates: 10

BATCH: WRLFMD/2010/00029



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FAO World Reference Laboratory for FMD Genotyping Report

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/25/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PRW 1	
Location: Rawalpindi, Pakistan	Topotype: ME-SA
Date collected: 01/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-25.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Cattle	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/PAK/28/2010	PAK10-28	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/29/2010	PAK10-29	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/26/2010	PAK10-26	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/42/2010	PAK10-42	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/62/2010	IRN10-62	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	630	0	98.59	1.41	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	607	0	94.99	5.01	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	596	0	93.27	6.73	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	584	0	91.39	8.61	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	573	0	89.67	10.33	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	569	0	89.05	10.95	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/26/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PRW 2	
Location: Rawalpindi, Pakistan	Topotype: ME-SA
Date collected: 01/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-26.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/PAK/25/2010	PAK10-25	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/28/2010	PAK10-28	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/29/2010	PAK10-29	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/42/2010	PAK10-42	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/62/2010	IRN10-62	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	630	0	98.59	1.41	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	607	0	94.99	5.01	ME-SA	PanAsia-2
3	O/TUR/257/2008* (FMDI)	TUR08-AD	639	605	0	94.68	5.32	ME-SA	PanAsia-2 ^{TER-08}
4	O/IRN/31/2009	IRN09-31	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{FAR-09}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	584	0	91.39	8.61	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	573	0	89.67	10.33	ME-SA	Ind-2001a
10	O/IRN/61/2001 (DQ164896)	IRN01-61	638	570	1	89.34	10.66	ME-SA	Iran-2001

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/28/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PRW 4	
Location: Rawalpindi, Pakistan	Topotype: ME-SA
Date collected: 01/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-28.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/PAK/25/2010	PAK10-25	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/29/2010	PAK10-29	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/26/2010	PAK10-26	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/42/2010	PAK10-42	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/62/2010	IRN10-62	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	630	0	98.59	1.41	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	607	0	94.99	5.01	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	596	0	93.27	6.73	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	584	0	91.39	8.61	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	573	0	89.67	10.33	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	569	0	89.05	10.95	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/29/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PRW 5	
Location: Rawalpindi, Pakistan	Topotype: ME-SA
Date collected: 05/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-29.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/PAK/25/2010	PAK10-25	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/28/2010	PAK10-28	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/26/2010	PAK10-26	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/42/2010	PAK10-42	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/62/2010	IRN10-62	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	630	0	98.59	1.41	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	607	0	94.99	5.01	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	596	0	93.27	6.73	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	584	0	91.39	8.61	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	573	0	89.67	10.33	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	569	0	89.05	10.95	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/31/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PRW 7	
Location: Rawalpindi, Pakistan	Topotype: ME-SA
Date collected: 05/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-31.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy2	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/PAK/36/2010	PAK10-36	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/96/2010	IRN10-96	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
3	O/IRN/139/2010	IRN10139	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
4	O/IRN/62/2010	IRN10-62	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/97/2010	IRN10-97	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	633	0	99.06	0.94	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	606	0	94.84	5.16	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	602	0	94.21	5.79	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	597	0	93.43	6.57	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	594	0	92.96	7.04	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	583	0	91.24	8.76	ME-SA	PanAsia
9	O/IRN/61/2001 (DQ164896)	IRN01-61	638	570	1	89.34	10.66	ME-SA	Irn-2001
10	O/KUW/3/97 (DQ164904)	KUW97-03	639	570	0	89.20	10.80	ME-SA	Ind-2001a

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/35/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: GBT 3	
Location: Giligit (Hundarab), Pakistan	Topotype: ME-SA
Date collected: 29/07/2010	Genotype/strain: PanAsia-2 ^{PUN-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-35.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Cattle	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/AFG/20/2010	AFG10-20	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
2	O/PAK/20/2010	PAK10-20	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
3	O/PAK/37/2010	PAK10-37	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
4	O/PAK/16/2010	PAK10-16	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
5	O/PAK/17/2010	PAK10-17	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
6	O/PAK/18/2010	PAK10-18	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
7	O/PAK/19/2010	PAK10-19	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
8	O/PAK/28/2007	PAK07-28	639	614	0	96.09	3.91	ME-SA	PanAsia-2
9	O/PAK/50/2007	PAK07-50	639	614	0	96.09	3.91	ME-SA	PanAsia-2
10	O/PAK/22/2007	PAK07-22	639	613	0	95.93	4.07	ME-SA	PanAsia-2
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/PAK/16/2010	PAK10-16	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
2	O/IRN/31/2009	IRN09-31	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{FAR-09}
3	O/IRN/8/2005	IRN05-08	639	600	0	93.90	6.10	ME-SA	PanAsia-2
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	599	0	93.74	6.26	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	594	0	92.96	7.04	ME-SA	PanAsia-2 ^{SAN-09}
7	O/IRN/88/2009	IRN09-88	639	593	0	92.80	7.20	ME-SA	PanAsia-2 ^{ANT-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	585	0	91.55	8.45	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	576	0	90.14	9.86	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	572	0	89.51	10.49	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/36/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: GBT 4	
Location: Giligit (Hundarab), Pakistan	Topotype: ME-SA
Date collected: 29/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-36.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Cattle	No. of Nt determined: 639
Material used: BTy2	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/IRN/96/2010	IRN10-96	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/31/2010	PAK10-31	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{ANT-10}
3	O/IRN/139/2010	IRN10139	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/IRN/62/2010	IRN10-62	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
5	O/IRN/97/2010	IRN10-97	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	634	0	99.22	0.78	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	607	0	94.99	5.01	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	605	0	94.68	5.32	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	603	0	94.37	5.63	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	596	0	93.27	6.73	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	595	0	93.11	6.89	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	584	0	91.39	8.61	ME-SA	PanAsia
9	O/IRN/61/2001 (DQ164896)	IRN01-61	638	571	1	89.50	10.50	ME-SA	Irn-2001
10	O/KUW/3/97 (DQ164904)	KUW97-03	639	571	0	89.36	10.64	ME-SA	Ind-2001a

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/37/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PSW 1	
Location: Sahiwal, Pakistan	Topotype: ME-SA
Date collected: 30/07/2010	Genotype/strain: PanAsia-2 ^{PUN-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-37.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 days
	Sequencing time: 18 days
Comments: FMDV type A also isolated from this sample.	

Most Closely Related Viruses

Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	O/AFG/20/2010	AFG10-20	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
2	O/PAK/20/2010	PAK10-20	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
3	O/PAK/35/2010	PAK10-35	639	639	0	100.00	0.00	ME-SA	PanAsia-2 ^{PUN-10}
4	O/PAK/16/2010	PAK10-16	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
5	O/PAK/17/2010	PAK10-17	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
6	O/PAK/18/2010	PAK10-18	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
7	O/PAK/19/2010	PAK10-19	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
8	O/PAK/28/2007	PAK07-28	639	614	0	96.09	3.91	ME-SA	PanAsia-2
9	O/PAK/50/2007	PAK07-50	639	614	0	96.09	3.91	ME-SA	PanAsia-2
10	O/PAK/22/2007	PAK07-22	639	613	0	95.93	4.07	ME-SA	PanAsia-2

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/PAK/16/2010	PAK10-16	639	638	0	99.84	0.16	ME-SA	PanAsia-2 ^{PUN-10}
2	O/IRN/31/2009	IRN09-31	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{FAR-09}
3	O/IRN/8/2005	IRN05-08	639	600	0	93.90	6.10	ME-SA	PanAsia-2
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	599	0	93.74	6.26	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	594	0	92.96	7.04	ME-SA	PanAsia-2 ^{SAN-09}
7	O/IRN/88/2009	IRN09-88	639	593	0	92.80	7.20	ME-SA	PanAsia-2 ^{ANT-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	585	0	91.55	8.45	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	576	0	90.14	9.86	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	572	0	89.51	10.49	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/40/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: PSW 4	
Location: Sahiwal, Pakistan	Topotype: ME-SA
Date collected: 30/07/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-40.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Buffalo	No. of Nt determined: 639
Material used: BTy2	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/IRN/30/2010	IRN10-30	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/4/2010	IRN10-04	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/15/2010	PAK10-15	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/21/2010	PAK10-21	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
5	O/PAK/22/2010	PAK10-22	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
6	O/PAK/3/2010	PAK10-03	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
7	O/PAK/4/2010	PAK10-04	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
8	O/PAK/9/2010	PAK10-09	639	637	0	99.69	0.31	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/100/2010	IRN10100	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/101/2010	IRN10101	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	606	0	94.84	5.16	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	597	0	93.43	6.57	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	597	0	93.43	6.57	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	594	0	92.96	7.04	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	585	0	91.55	8.45	ME-SA	PanAsia
9	O/PAK/16/2003 (DQ165068)	PAK03-16	639	571	0	89.36	10.64	ME-SA	Pak-98
10	O/IRN/61/2001 (DQ164896)	IRN01-61	638	570	1	89.34	10.66	ME-SA	Irn-2001

nt, nucleotides

*, not a WRLFMD reference number

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Serotype: O	Report date: 05/10/2010
WRLFMD Ref No: PAK/42/2010	Reported by: N.J. Knowles
Batch No: WRLFMD/2010/00029	Checked by: D.P. King
Sender Ref: ISB 1	
Location: Islamabad, Pakistan	Topotype: ME-SA
Date collected: 12/08/2010	Genotype/strain: PanAsia-2 ^{ANT-10}
Date received by WRLFMD: 31/08/2010	Sequence filename: PAK10-42.SEQ
Date received for sequencing: 17/09/2010	Date sequence last updated: 03/10/2010
Species: Cattle	No. of Nt determined: 639
Material used: BTy1	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: O-1C244F/EUR-2B52R	Total no. of comparisons: 2292
O-1C272F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 35 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	O/IRN/62/2010	IRN10-62	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
2	O/PAK/25/2010	PAK10-25	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
3	O/PAK/26/2010	PAK10-26	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
4	O/PAK/28/2010	PAK10-28	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
5	O/PAK/29/2010	PAK10-29	639	636	0	99.53	0.47	ME-SA	PanAsia-2 ^{ANT-10}
6	O/IRN/106/2010	IRN10106	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
7	O/IRN/120/2010	IRN10120	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
8	O/IRN/126/2010	IRN10126	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
9	O/IRN/146/2010	IRN10146	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
10	O/IRN/148/2010	IRN10148	639	635	0	99.37	0.63	ME-SA	PanAsia-2 ^{ANT-10}
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/IRN/88/2009	IRN09-88	639	631	0	98.75	1.25	ME-SA	PanAsia-2 ^{ANT-10}
2	O/IRN/8/2005	IRN05-08	639	608	0	95.15	4.85	ME-SA	PanAsia-2
3	O/IRN/31/2009	IRN09-31	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{FAR-09}
4	O/TUR/257/2008* (FMDI)	TUR08-AD	639	604	0	94.52	5.48	ME-SA	PanAsia-2 ^{TER-08}
5	O/IRN/18/2010	IRN10-18	639	599	0	93.74	6.26	ME-SA	PanAsia-2 ^{BAL-09}
6	O/TUR/264/2009* (FMDI)	TUR09-AK	639	599	0	93.74	6.26	ME-SA	PanAsia-2 ^{SAN-09}
7	O/PAK/16/2010	PAK10-16	639	598	0	93.58	6.42	ME-SA	PanAsia-2 ^{PUN-10}
8	O/UKG/35/2001 (AJ539141)	UKG01-35	639	585	0	91.55	8.45	ME-SA	PanAsia
9	O/KUW/3/97 (DQ164904)	KUW97-03	639	574	0	89.83	10.17	ME-SA	Ind-2001a
10	O/OMN/7/2001 (DQ164941)	OMN01-07	639	572	0	89.51	10.49	ME-SA	Ind-2001b

nt, nucleotides

*, not a WRLFMD reference number

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Report on FMDV O in Pakistan in 2010

Batch: WRLFMD/2010/00029

Software: MEGA 4.0

No. of Taxa : 369

Data File : n:\levd\meg\db\fmdv\o\PAK2010a.meg

Data Title : O Pakistan & Turkey 2010

Data Type : Nucleotide (Coding)

Analysis : Phylogeny reconstruction

Tree Inference : =====

->Method : Neighbor-Joining

->Phylogeny Test and options : Bootstrap (1000 replicates; seed=64238)

Include Sites : =====

->Gaps/Missing Data : Pairwise Deletion

->Codon Positions : 1st+2nd+3rd+Noncoding

Substitution Model : =====

->Model : Nucleotide: Kimura 2-parameter

->Substitutions to Include : d: Transitions + Transversions

->Pattern among Lineages : Same (Homogeneous)

->Rates among sites : Uniform rates

No. of Sites : 639

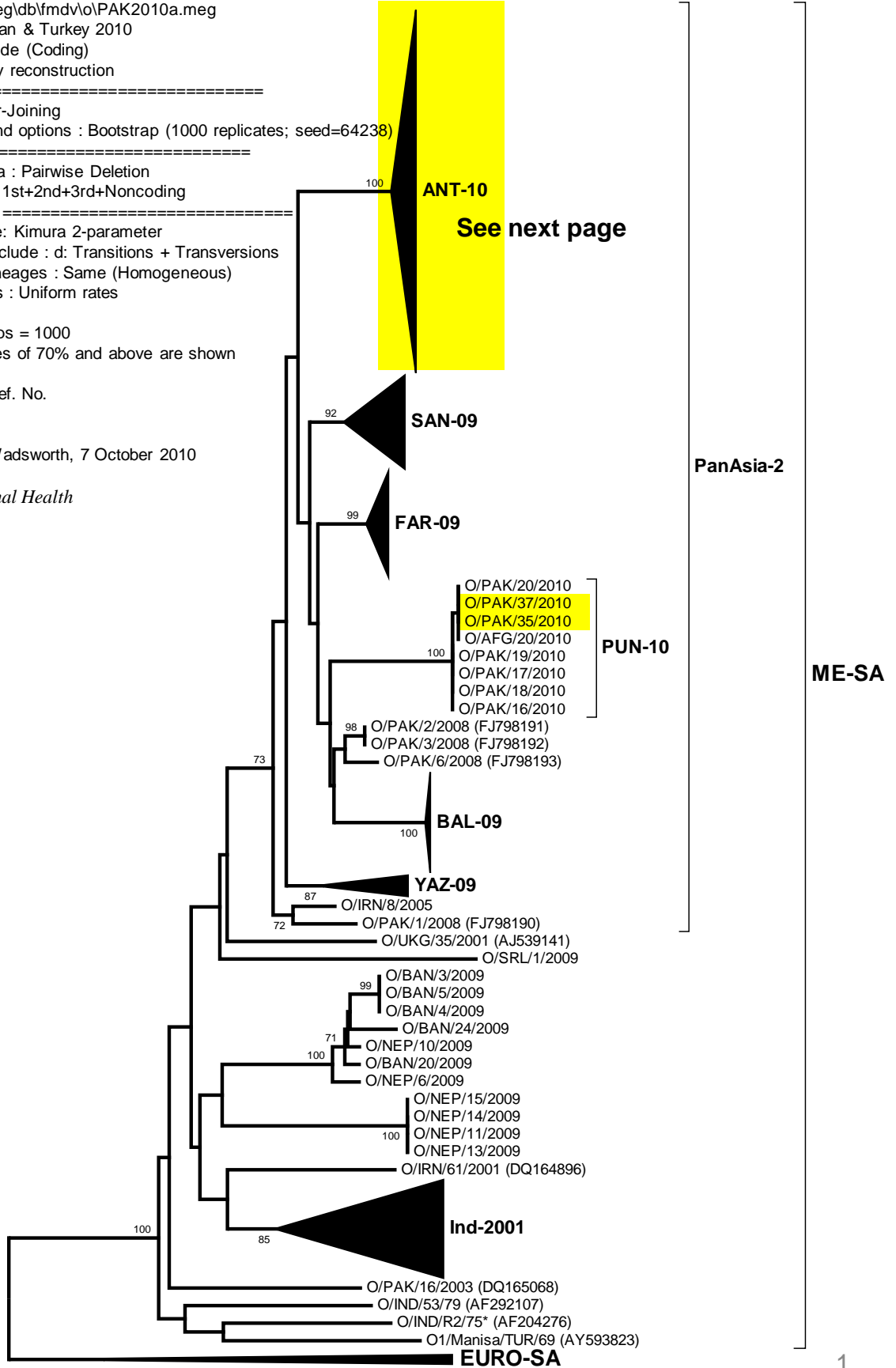
No Of Bootstrap Reps = 1000

Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

N.J. Knowles & J. Wadsworth, 7 October 2010

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Report on FMDV O in Pakistan in 2010

Batch: WRLFMD/2010/00029

Software: MEGA 4.0
No. of Taxa : 369
Data File : n:\evd\meg\db\fmdv\o\PAK2010a.meg
Data Title : O Pakistan & Turkey 2010
Data Type : Nucleotide (Coding)
Analysis : Phylogeny reconstruction
Tree Inference : =====
->Method : Neighbor-Joining
->Phylogeny Test and options : Bootstrap (1000 replicates; seed=64238)
Include Sites : =====
->Gaps/Missing Data : Pairwise Deletion
->Codon Positions : 1st+2nd+3rd+Noncoding
Substitution Model : =====
->Model : Nucleotide: Kimura 2-parameter
->Substitutions to Include : d: Transitions + Transversions
->Pattern among Lineages : Same (Homogeneous)
->Rates among sites : Uniform rates
No. of Sites : 639
No Of Bootstrap Reps = 1000
Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

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O/IRN/158/2010
O/IRN/20/2010
O/IRN/39/2010
O/IRN/98/2010
O/IRN/137/2010
O/IRN/37/2010
O/IRN/19/2010
O/IRN/89/2010
O/IRN/101/2010
O/IRN/15/2010
O/IRN/90/2010
O/IRN/40/2010
O/IRN/65/2010
O/IRN/85/2010
O/IRN/91/2010
O/IRN/86/2010
O/IRN/59/2010
O/IRN/27/2010
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O/IRN/113/2010
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O/IRN/61/2010
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O/IRN/71/2010
O/IRN/154/2010
O/IRN/155/2010
O/IRN/124/2010
O/IRN/48/2010
O/IRN/131/2010
O/IRN/43/2010
O/IRN/105/2010
O/IRN/130/2010
O/IRN/51/2010
O/IRN/41/2010
O/IRN/55/2010
O/IRN/78/2010
O/IRN/44/2010
O/IRN/93/2010
O/IRN/156/2010
O/IRN/133/2010
O/IRN/99/2010
O/PAK/7/2010
O/PAK/14/2010
O/IRN/160/2010
O/UAE/1/2010
O/UAE/4/2010
O/UAE/2/2010
O/UAE/3/2010
O/IRN/144/2010
O/IRN/28/2010
O/IRN/88/2010
O/IRN/4/2010
O/IRN/4/2010
O/PAK/3/2010
O/PAK/4/2010
O/IRN/30/2010
O/IRN/47/2010
O/IRN/13/2010
O/IRN/31/2010
O/IRN/52/2010
O/IRN/173/2010
O/IRN/2/2010
O/IRN/12/2010
O/IRN/11/2010
O/IRN/172/2010
O/PAK/1/2010
O/PAK/2/2010
O/PAK/5/2010
O/PAK/8/2010
O/PAK/15/2010
O/PAK/9/2010
O/PAK/40/2010
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O/IRN/66/2010
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O/IRN/64/2010
O/IRN/60/2010
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O/TUR/154/2010* (FMDI)
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O/TUR/12/2010
O/IRN/114/2010
O/TUR/38/2010
O/IRN/115/2010
O/TUR/18/2010
O/TUR/35/2010

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