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Supplementary Data

JPEH-2-Japan ATGCCTAAAGAACGACGGTCCCCGAAGACGCCCACAACCGATCATCAGATGGGTAAGTCTC
60

BLV-XJ-4-China ----- 60

BLV-XJ-26-China ----- 60

BLV-XJ-65-China -----g-----t 60

BLV-XJ-87-China ----- 60

BLV-XJ-91-China ----- 60

BLV-XJ-102-China -----g----- 60

JPEH-2-Japan ACTCTCACTCTCCTCGCTCTCTCTCGGCCCATCCAGACTTGGAGATGCTCCCTGTCCCTA 120

BLV-XJ-4-China ----- 120

BLV-XJ-26-China -----g----- 120

BLV-XJ-65-China -----g-a----- 120

BLV-XJ-87-China ----t--t-----g-a----- 120

BLV-XJ-91-China -----g----- 120

BLV-XJ-102-China -----g-a----- 120

JPEH-2-Japan GGAAACCAACAATGGATGACAGCATATAACCAAGAGGCAAAATTTCCATCTCCATTGAC
180

BLV-XJ-4-China ----- 180

BLV-XJ-26-China ----- 180

BLV-XJ-65-China ----t-----a----- 180

BLV-XJ-87-China ----t-----a-----g----- 180

BLV-XJ-91-China -----c----- 180

BLV-XJ-102-China ----- 180

JPEH-2-Japan CAAATACTAGAGGCTCATAATCAGTCACCTTTCTGTGCCAAGTCTCCCAGATACACCTTG
240

BLV-XJ-4-China ----- 240

BLV-XJ-26-China -----a----- 240

BLV-XJ-65-China -----a-g-----a 240

BLV-XJ-87-China -----a-----c-g----- 240

BLV-XJ-91-China ----- 240

BLV-XJ-102-China ----- 240

JPEH-2-Japan GACTCTGTAAATGGCTATCCTAAGATCTACTGGCCCCCCCCACAAGGGCGGCGCCGGTTT
300

BLV-XJ-4-China	-----	300
BLV-XJ-26-China	-----	300
BLV-XJ-65-China	---t-----t-----	300
BLV-XJ-87-China	---t-----t-----g-----a-----	300
BLV-XJ-91-China	-----	300
BLV-XJ-102-China	-----c-----	300

JPEH-2-Japan GGAGCCAGGGCCATGGTCACATATGATTGCGAGCCCCGATGCCCTTATGTGGGGGCAGAT
360

BLV-XJ-4-China	-----	360
BLV-XJ-26-China	-----	360
BLV-XJ-65-China	-----	360
BLV-XJ-87-China	-----	360
BLV-XJ-91-China	-----	360
BLV-XJ-102-China	-----	360

JPEH-2-Japan CGCTTCGACTGCCCCCACTGGGACAATGCCTCCCAGGCCGATCAAGGATCCTTTTATGTC
420

BLV-XJ-4-China	-----	420
BLV-XJ-26-China	-----	420
BLV-XJ-65-China	--t-----at---g-----	420
BLV-XJ-87-China	-----	420
BLV-XJ-91-China	-----t---a---t-----	420
BLV-XJ-102-China	-----g-----	420

JPEH-2-Japan AATCATCAGATTTTATTCCTGCATCTCAAACAATGTCATGGAATTTTCACTTTAACCTGG 480

BLV-XJ-4-China	-----	480
BLV-XJ-26-China	-----c-----	480
BLV-XJ-65-China	-----c-----c-----	480
BLV-XJ-87-China	-----c-----c-----	480
BLV-XJ-91-China	-----c-----c-----	480
BLV-XJ-102-China	-----c-----	480

JPEH-2-Japan GAGATATGGGGATATGATCCCCTGATCACCTTTTCTTTACATAAGATCCCTGATCCCCCT
540

BLV-XJ-4-China	-----	540
BLV-XJ-26-China	--a-----	540
BLV-XJ-65-China	--a-----a-----	540
BLV-XJ-87-China	--a-----c-----a-----	540
BLV-XJ-91-China	-----	540
BLV-XJ-102-China	-----	540

JPEH-2-Japan CAACCCGACTTTCCCCAGTTGACCAGTGACTGGGTTCCTCTGTCAGATCATGGGCCCTG
600

BLV-XJ-4-China ----- 600

BLV-XJ-26-China -g-----a----- 600

BLV-XJ-65-China -----c-t-----a----- 600

BLV-XJ-87-China -----c-t-----a----- 600

BLV-XJ-91-China -----a----- 600

BLV-XJ-102-China -----a----- 600

JPEH-2-Japan CTTTAAATCAAACAGCACGGGCCTTCCCAGACTGTGCTATATGTTGGGAACCTTCCCCT
660

BLV-XJ-4-China ----- 660

BLV-XJ-26-China -----g----- 660

BLV-XJ-65-China -----g-----c----- 660

BLV-XJ-87-China -----g----- 660

BLV-XJ-91-China ----- 660

BLV-XJ-102-China -----g----- 660

JPEH-2-Japan CCCTGGGCTCCCGAAATATTAGTATATAACAAAACCATCTCCAGCTCTGGACCCGGCCTC
720

BLV-XJ-4-China.t ----- 720

BLV-XJ-26-China. ----- 720

BLV-XJ-65-China. ----- 720

BLV-XJ-87-China. -----c-----t--- 720

BLV-XJ-91-China. ----- 720

BLV-XJ-102-China ----- 720

JPEH-2-Japan GCCCTCCCGGACGCCCAAATCTTCTGGGTCAACACGTCCTCGTTTAACACCACCCAAGGA
780

BLV-XJ-4-China -----t----- 780

BLV-XJ-26-China ----- 780

BLV-XJ-65-China -----g----ta----- 780

BLV-XJ-87-China -----t-----t----- 780

BLV-XJ-91-China ----- 780

BLV-XJ-102-China -----t----- 780

JPEH-2-Japan TGGCACCACCCTTCCCAGAGGTTGTTGTTCAATGTTTCTCAAGGCAACGCCTTGTTATTA
840

BLV-XJ-4-China ----- 840

BLV-XJ-26-China	-----	840
BLV-XJ-65-China	-----a-----a-----a-----	840
BLV-XJ-87-China	-----c-----a-----	840
BLV-XJ-91-China	-----	840
BLV-XJ-102-China	-----	840
JPEH-2-Japan	CCTCCTATCTCCCTGGTTAATCTCTCTACGGCTTCCTCCGCCCCTCCTACCCGGGTC	897
BLV-XJ-4-China	-----	897
BLV-XJ-26-China	-----	897
BLV-XJ-65-China	--c-----a-----	897
BLV-XJ-87-China	--c-----t-----	897
BLV-XJ-91-China	--c-----	897
BLV-XJ-102-China	-----	897

Supplemental Fig. S1: Alignment of the nucleotide sequences of *env* gene of BLV strains circulating in Xinjiang China
Note: JPEH-2 strain of BLV from Japan (EF065653) was used as the reference sequence.

JPEH-2-Japan	MPKERRSRRRPQPIIRWVSLTLTLLALSRPIQTWRCSLSLGNQQWMTAYNQEAKFSISID	60
BLV-XJ-4-China	-----	60
BLV-XJ-26-China	-----c-----	60
BLV-XJ-65-China	-----e-----cq-----t-----	60
BLV-XJ-87-China	-----f--cq-----t-----	60
BLV-XJ-91-China	-----c-----	60
BLV-XJ-102-China	-----e-----cq-----	60
CD4⁺ epitope ND1		
JPEH-2-Japan	QILEAHNQSPFCAKSPRYTLDSVNGYPKIYWPPPQGRRRFGARAMVTYDCEPRCPYVGAD	120
BLV-XJ-4-China	-----	120
BLV-XJ-26-China	-----	120
BLV-XJ-65-China	-----f-----	120
BLV-XJ-87-China	-----pr----f-----	120
BLV-XJ-91-China	-----	120
BLV-XJ-102-China	-----	120
ND2 CD8⁺ epitope		
JPEH-2-Japan	RFDCPHWDNASQADQGSFYVNHQILFLHLKQCHGIFTLTWEIWGYDPLITFSLHKIPDPP	180
BLV-XJ-4-China	-----	180
BLV-XJ-26-China	-----	180
BLV-XJ-65-China	-----d-----t-----	180
BLV-XJ-87-China	-----	180
BLV-XJ-91-China	-----n-----s-----	180
BLV-XJ-102-China	-----	180
CD8⁺ epitope ND3 B-epitope		
JPEH-2-Japan	QPDFPQLTSDWVPSVRSWALLNQTARAFPDCAICWEPSPPWAPEILVYNKTISSSGPGL	240
BLV-XJ-4-China	-----	240
BLV-XJ-26-China	r----n-----	240
BLV-XJ-65-China	-----n-----	240
BLV-XJ-87-China	-----n-----	240
BLV-XJ-91-China	-----n-----	240
BLV-XJ-102-China	-----n-----	240
B-epitope		
JPEH-2-Japan	ALPDAQIFWVNTSSFNTTQGWHHPSQRLLFNVSQGNALLPPISLVNLSTASSAPPTRV	299
BLV-XJ-4-China	-----l-----	299
BLV-XJ-26-China	-----	299
BLV-XJ-65-China	-----a-l-----k-----	299
BLV-XJ-87-China	-----l-----v-----	299
BLV-XJ-91-China	-----	299
BLV-XJ-102-China	-----	299

Supplemental Fig. S2: Alignment of the deduced amino acid sequences of env (gp51) protein of BLV strains circulating in Xinjiang China

Note: JPEH-2 strain of BLV from Japan (EF065653) was used as the reference sequence.

Supplemental Table S1: Information of nucleotide sequences of *env* gene of BLV in this study

Virus	Host	Strain/isolate	GenBank accession number	Geographic origin
<i>Bovine leukemia virus</i>	Bovine	-	LC007992	Japan
<i>Bovine leukemia virus</i>	Bovine	-	LC007993	Japan
<i>Bovine leukemia virus</i>	Bovine	JPKA-2	EF065659	Japan
<i>Bovine leukemia virus</i>	Bovine	JPEH-2	EF065653	Japan
<i>Bovine leukemia virus</i>	Bovine	YR2	KT122858	Belgium
<i>Bovine leukemia virus</i>	Bovine	LB285	M35240	Belgium
<i>Bovine leukemia virus</i>	Bovine	GBGS-12	KP201465	South Korea
<i>Bovine leukemia virus</i>	Bovine	GBGS-1	KP201466	South Korea
<i>Bovine leukemia virus</i>	Bovine	GBGS-4	KP201468	South Korea
<i>Bovine leukemia virus</i>	Bovine	-	AY995174	South Korea
<i>Bovine leukemia virus</i>	Bovine	468-22	AY078387	USA
<i>Bovine leukemia virus</i>	Bovine	USCA-2	EF065648	USA
<i>Bovine leukemia virus</i>	Bovine	USCA-3	EF065649	USA
<i>Bovine leukemia virus</i>	Bovine	CRLC-2	EF065654	Costa Rica
<i>Bovine leukemia virus</i>	Bovine	CRGC	EF065639	Costa Rica
<i>Bovine leukemia virus</i>	Bovine	30	AF399703	Brazil
<i>Bovine leukemia virus</i>	Bovine	Australian isolate	D00647	Australia
<i>Bovine leukemia virus</i>	Bovine	mon1	LC080659	Bolivia
<i>Bovine leukemia virus</i>	Bovine	por108	LC080675	Bolivia
<i>Bovine leukemia virus</i>	Bovine	por28	LC080668	Bolivia
<i>Bovine leukemia virus</i>	Bovine	B19	AF257515	Argentina
<i>Bovine leukemia virus</i>	Bovine	Arg41	FJ914764	Argentina
<i>Bovine leukemia virus</i>	Bovine	PL-1238	FJ808582	Argentina
<i>Bovine leukemia virus</i>	Bovine	par62	LC080656	Paraguay
<i>Bovine leukemia virus</i>	Bovine	par91	LC080658	Paraguay
<i>Bovine leukemia virus</i>	Bovine	Uru38	FM209471	Uruguay
<i>Bovine leukemia virus</i>	Bovine	4-6	HM563764	Ukraine
<i>Bovine leukemia virus</i>	Bovine	I2	S83530	Italy
<i>Bovine leukemia virus</i>	Bovine	Australian type 151	EU262555	Poland
<i>Bovine leukemia virus</i>	Bovine	68	HM563774	Poland
<i>Bovine leukemia virus</i>	Bovine	NB7	JQ686110	Russia
<i>Bovine leukemia virus</i>	Bovine	MKC2137	JQ675759	Russia
<i>Bovine leukemia virus</i>	Bovine	MKC3511	JQ675760	Russia
<i>Bovine leukemia virus</i>	Bovine	KE7	JQ686093	Russia
<i>Bovine leukemia virus</i>	Bovine	MC19	JQ686089	Russia
<i>Bovine leukemia virus</i>	Bovine	LB59	M35238	France
<i>Bovine leukemia virus</i>	Bovine	8MD	KF801459	Moldova
<i>Bovine leukemia virus</i>	Bovine	10MD	KF801460	Moldova
<i>Bovine leukemia virus</i>	Bovine	Ns94-D4	KU233544	Thailand
<i>Bovine leukemia virus</i>	Bovine	Pa51-A3	KU233547	Thailand
<i>Bovine leukemia virus</i>	Bovine	Lo19-E1	KU233534	Thailand
<i>Bovine leukemia virus</i>	Bovine	Ch2-F1	KU233527	Thailand
<i>Bovine leukemia virus</i>	Bovine	Pr67-C5	KU233555	Thailand
<i>Bovine leukemia virus</i>	Bovine	S5	LC154065	Myanmar
<i>Bovine leukemia virus</i>	Bovine	L1	LC154066	Myanmar
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-4	MN765152	China
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-26	MN765153	China
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-65	MN765154	China
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-87	MN765155	China
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-91	MN765156	China
<i>Bovine leukemia virus</i>	Bovine	BLV-XJ-102	MN765157	China