

Additional file 4 *pvmsp-7E* gene alignment.

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1
#Haplotype_1 ATG AAA GGA GTC ACT GGG CCG ATC TGT TGT CTT TTC CTG TTT CTG TTC AGC TGC GCG TCG TCG GAA AAG TTG GGC GTC CAG AAA AAG AAA AAA AAT CTG GAG CAG GAC GCG ACG CAC GCG
#Haplotype_2 ...
#Haplotype_3 ...
#Haplotype_4 ...G...C...T...
#Haplotype_5 ...
#Haplotype_6 ...
#Haplotype_7 ...
#Haplotype_8 ...
#Haplotype_9 ...
#Haplotype_10 ...
#Haplotype_11 ...
#Haplotype_12 ...
#Haplotype_13 ...
#Haplotype_14 ...
#Haplotype_15 ...
#Haplotype_16 ...
#Haplotype_17 ...
#Haplotype_18 ...
#Haplotype_19 ...
#Haplotype_20 ...
#Haplotype_21 ...
#Haplotype_22 ...
#Haplotype_23 ...
#P_cynomolgi ...G.A.A.A..T...G...T...AC...T.G...T...

121
#Haplotype_1 TTG ATG AAG AAG TTG GAA AGT CTG TAC AAA CTC AGT GCA ACG GAC AAC AGC GAA ATT TTT AAC AAA GAA ATT GAG TCG TTG AAA AAG CAG ATT GAT CAG TTG CAC CAA CAT GGT GGG GAA
#Haplotype_2 ...
#Haplotype_3 ...
#Haplotype_4 ...G...T...G...C...G...H...G...C...
#Haplotype_5 ...
#Haplotype_6 ...
#Haplotype_7 ...
#Haplotype_8 ...G...C...G...G...C...
#Haplotype_9 ...
#Haplotype_10 ...
#Haplotype_11 ...
#Haplotype_12 ...G...T...G...C...G...H...G...C...
#Haplotype_13 ...
#Haplotype_14 ...G...T...G...C...G...H...G...C...
#Haplotype_15 ...
#Haplotype_16 ...
#Haplotype_17 ...G...T...G...C...G...H...G...C...
#Haplotype_18 ...
#Haplotype_19 ...
#Haplotype_20 ...
#Haplotype_21 ...
#Haplotype_22 ...
#Haplotype_23 ...
#P_cynomolgi ...C...A...T...G...C...G...A.T...G...G...A...C...A...T...

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241

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#Haplotype_1 AAC GAA GGG GAG AGT TTA GGC CAC CTT CTA GAA AGC GAG GCC GCC AAT GAG TCA GCC AAA AAG ACC ATT TTT GGA GTG GAC GAA GAC GAT TTA GAT AAC TAC GAC GCG GAC TTC ATT GGA
#Haplotype_2 .....
#Haplotype_3 .....
#Haplotype_4 .....A.....
#Haplotype_5 .....
#Haplotype_6 .....
#Haplotype_7 .....
#Haplotype_8 .....A.....
#Haplotype_9 .....
#Haplotype_10 .....
#Haplotype_11 .....
#Haplotype_12 .....A.....
#Haplotype_13 .....A.....
#Haplotype_14 .....A.....
#Haplotype_15 .....
#Haplotype_16 .....
#Haplotype_17 .....A.....
#Haplotype_18 .....
#Haplotype_19 .....
#Haplotype_20 .....
#Haplotype_21 .....
#Haplotype_22 .....
#Haplotype_23 .....
#P_cynomolgi .T.....A.A.C...T.....A.A...C.....A...G.....C..C.A...T..C.G.....T.T...T.CA...

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361

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#Haplotype_1 CAG AGC AAA GGC AAA ATT AAG GGG CAA GCG GAT ACA GAC AAC CAA GCT CAG AGA --- ACT GCT GAC GTG GCG GCC CAA CCC GGG GGT GTA TCA CCT TCT ACG AGT GCC CGA CCA CAG GAA
#Haplotype_2 .....
#Haplotype_3 .....A...G..G..G..G.T..GC..A.....AGC C...G..C..G...A...A.....
#Haplotype_4 .....A.A...A.....T..G...T..G...GCT C...AC A..T..C...G..C..AA.....C...A..T..T..G..G...GG.A.....
#Haplotype_5 .....
#Haplotype_6 .....
#Haplotype_7 .....
#Haplotype_8 .....A.A...A.....T..G...T..G...GCT C...AC A..T..C...G..C..AA.....C...A..T..T..G..G...GG.A.....
#Haplotype_9 .....A...G..G..G..G.T..GC..A.....AGC C...G..C..G...A...A.....
#Haplotype_10 .....
#Haplotype_11 .....
#Haplotype_12 .....A.A...A.....T..G...T..G...GCT C...AC A..T..C...G..C..AA...C.C..A..T..T..G..G...GG.A.....
#Haplotype_13 .....A.A...A.....T..G...T..G...GCT C...AC A..T..C...G..C..AA...C...A..T..T..G..G...GG.A.....
#Haplotype_14 .....A.A...A.....T..G...T..G...GCT C...AC A..T..C...G..C..AA...C...A..T..T..G..G...GG.A.....
#Haplotype_15 .....
#Haplotype_16 .....
#Haplotype_17 .....A...G..G..G..G.T..GC..A.....AGC C...G..C..G...A...A.....
#Haplotype_18 .....
#Haplotype_19 .....A...G..G..G..G.T..GC..A.....AGC C...G..C..G...A...A.....
#Haplotype_20 .....
#Haplotype_21 .....
#Haplotype_22 .....
#Haplotype_23 .....
#P_cynomolgi ...G...A...A...A...G.C.G.GCC...GA.ACT...GC.A..T...G...G...A.G...A.G...T..GA..G..G..G..A..A...C..

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480





	961																										1080																										1167																									
#Haplotype_1	TCT	TCA	GAT	GCT	ACT	CCC	CTA	GTT	GAC	GTT	TTT	AAA	AAA	GCG	TTA	GCT	GAC	GAG	ACA	TTT	CAA	GCC	GAG	TTT	GAT	AAC	TTT	GTA	CAT	GGG	CTG	TAC	GGA	TTT	GCT	AAA	AGG	CAT	AAC	TAC																																						
#Haplotype_2	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_3	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_4	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_5	...																...																																																													
#Haplotype_6	...																...																																																													
#Haplotype_7	...																...																																																													
#Haplotype_8	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_9	...																...																																																													
#Haplotype_10	...																...																																																													
#Haplotype_11	...																...																																																													
#Haplotype_12	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_13	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_14	.A	G.T	.C.	...	T.C	---	.G	...									.G	...																																																												
#Haplotype_15	...																...																																																													
#Haplotype_16	.A	G.T	.C.	...	T.C	---	.G	...									.A	...																																																												
#Haplotype_17	.A	G.T	.C.	...	T.C	---	.G	...									.A	...																																																												
#Haplotype_18	...																...																																																													
#Haplotype_19	...																...																																																													
#Haplotype_20	.A	G.T	.C.	...	T.C	---	.G	...									.A	...																																																												
#Haplotype_21	...																...																																																													
#Haplotype_22	.A	G.T	.C.	...	T.C	---	.G	...									.A	...																																																												
#Haplotype_23	...																...																																																													
#P_cynomolgi	.A	G.T	.C.	AA.	T.C	---	.G	ACG	.A						.TC	.TA	.T	.A	.A				.A	.A	A.C			.G	.C					.T			.G	.A	.C				.T																																			

  

#Haplotype_1	CTA	AGT	GAG	GCG	CGG	ATG	AAG	GAT	GCT	GAT	CGC	TAC	ACC	AAT	CTG	CTA	AAG	AAC	GCC	ATC	AGC	TTG	ATG	TAC	ACC	ATT	---	---	---	---	---															
#Haplotype_2	...							.G	...																																					
#Haplotype_3	...																																													
#Haplotype_4	...																																													
#Haplotype_5	...																																													
#Haplotype_6	...																																													
#Haplotype_7	...																																													
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#Haplotype_11	...																																													
#Haplotype_12	...																																													
#Haplotype_13	...																																													
#Haplotype_14	...																																													
#Haplotype_15	...																																													
#Haplotype_16	T			.A	.A			.C	AA	.A.A	T		T	G	T	.G	.A																													
#Haplotype_17	...							.C																																						
#Haplotype_18	...							.C																																						
#Haplotype_19	...							.C																																						
#Haplotype_20	T			.A	.A			.C	AA	.A.A	T		T	G	T	.G	.A																													
#Haplotype_21	...							.C																																						
#Haplotype_22	...							.C																																						
#Haplotype_23	...							.C																																						
#P_cynomolgi	T	G	.A	T	AAA	.A	C	T	G	.A	C	A	G	ACA	GT	G	.T	G																												

The alignment shows the 23 haplotypes found in *pvm*sp-7*E* together with the *pc*msp-7*E* haplotype. Haplotype 1, Sal-I; Haplotype 2, Brazil-I; Haplotype 3, India-VII; Haplotype 4, Mauritania-I; Haplotype 5-23, Colombian isolates. Dots represent nucleotide identity. Codons under positive selection are shown in green (intra-species) and turquoise (inter-species) and those under negative selection are shown in yellow (intra-species) and fuchsia (inter-species).