

Phylogeography of *Nanorana parkeri* (Anura: Ranidae) and multiple refugia on the Tibetan Plateau revealed by mitochondrial and nuclear DNA

Supplementary Information

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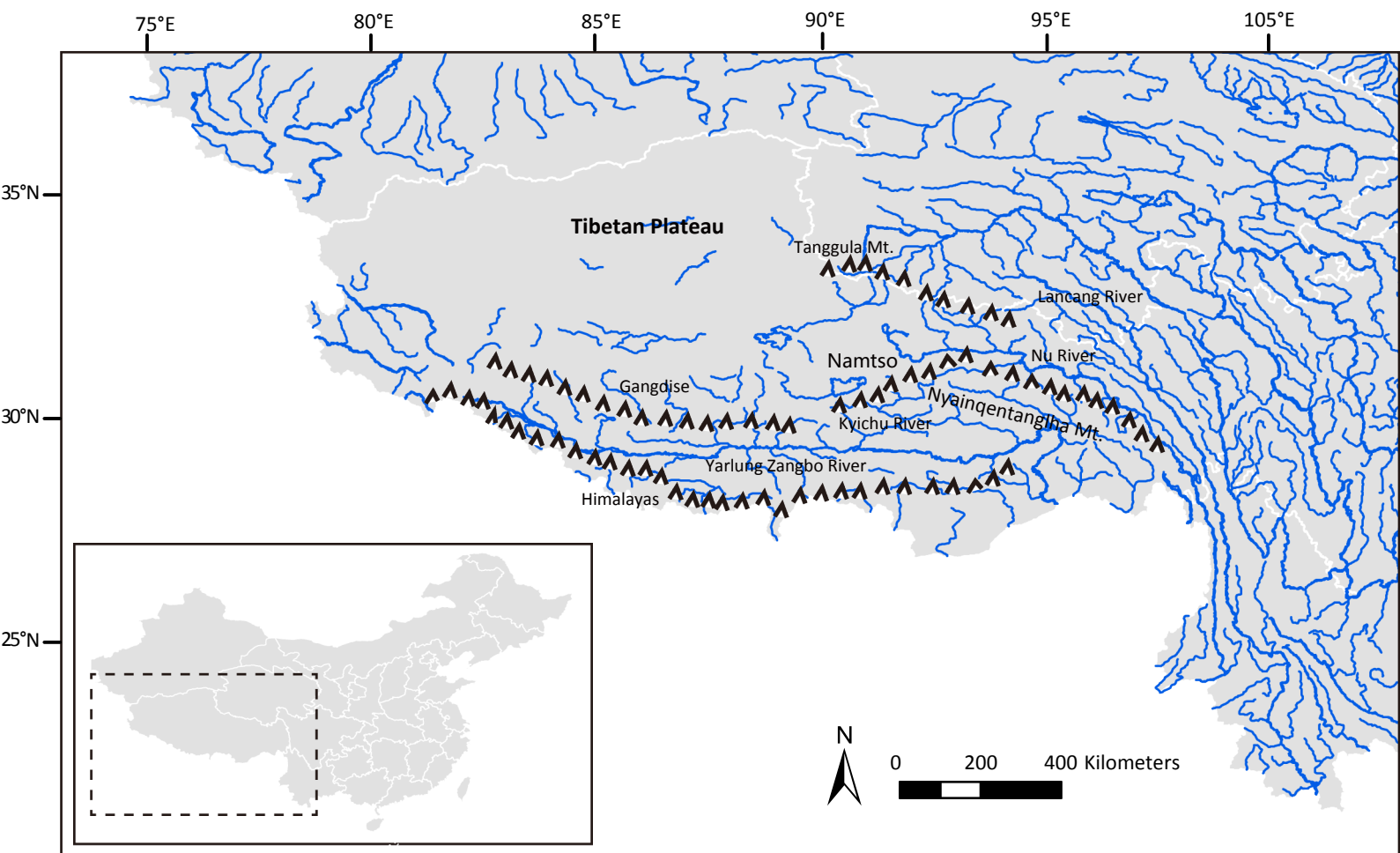
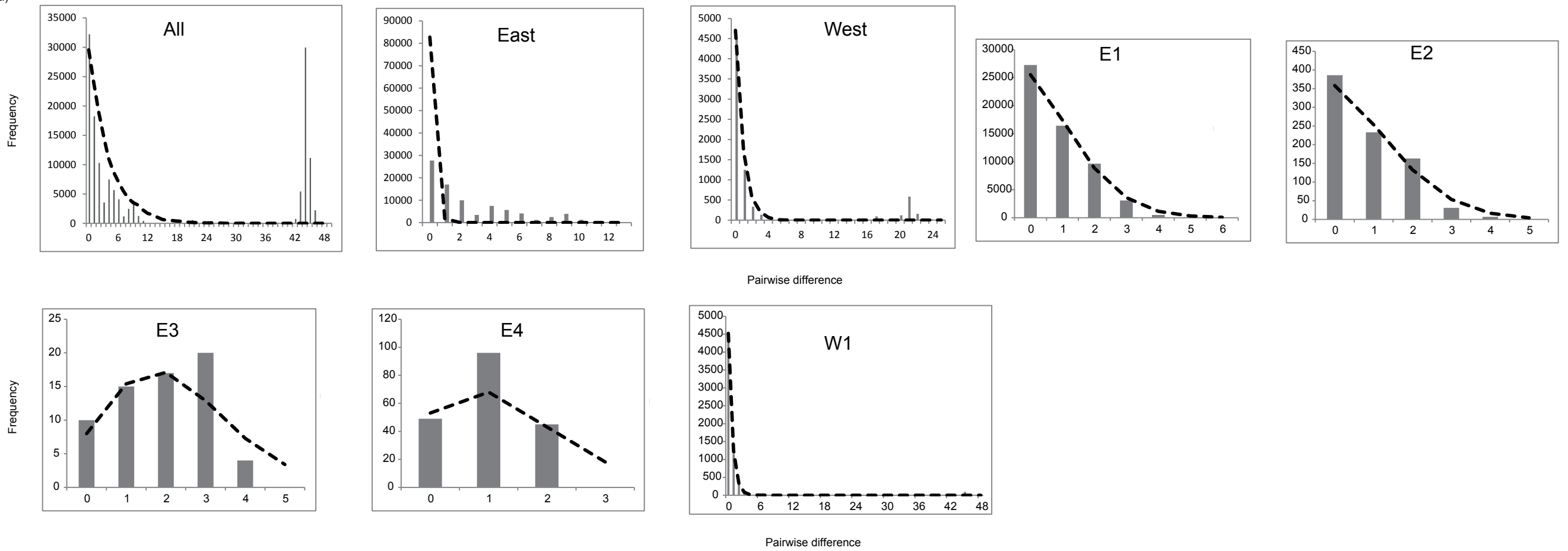


Figure S1 Simplified map exhibiting mountains and rivers in the southern Tibetan Plateau. The map was generated using ArcGIS v10.1 (ESRI, CA, USA) and Adobe Illustrator CS5 v15.0.0 (Adobe Systmes Inc., San Francisco, CA).

(a)



(b)

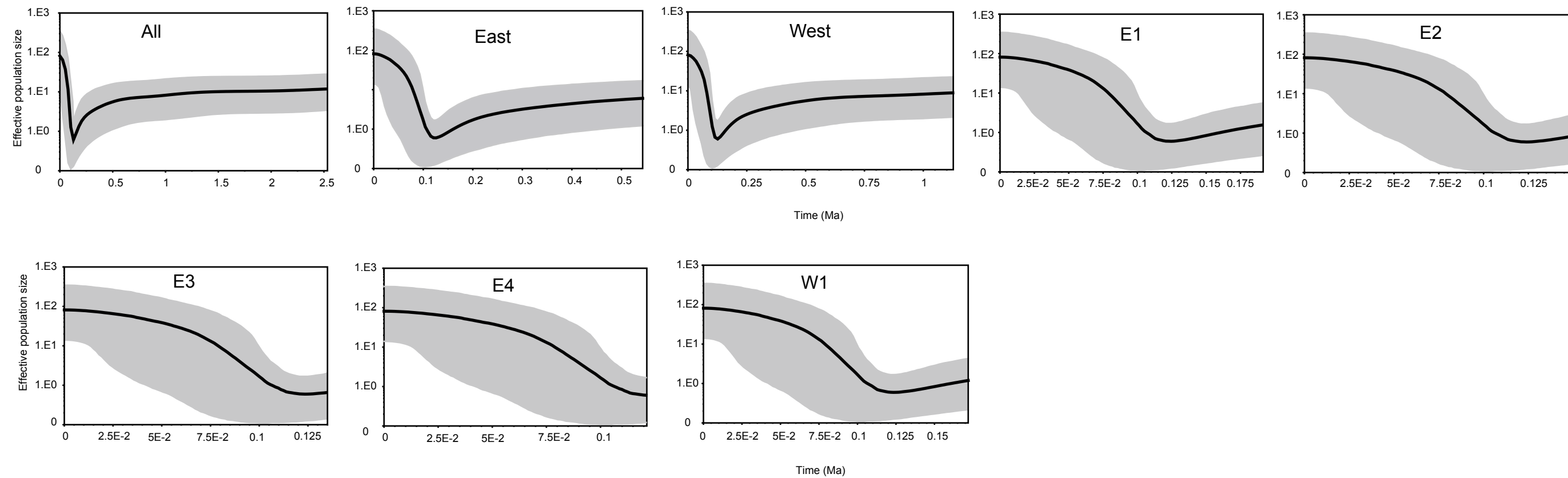


Figure S2 Mismatch distributions (a) and Bayesian skyline plot (BSP) analyses (b) for the *Cytb* (sub)lineages. The demographic trend for the sublineage W2 was not investigated in the mismatch and BSP analyses because of the small sample size ($n = 9$). Bars in the mismatch distributions represent the observed frequency of pairwise differences, and the dashed lines indicate the expected distribution under a model of population expansion. In the BSP, the thick solid line depicts the median estimate and the shading is the 95% highest posterior density (HPD) limits. The Y-axis (logarithmic scale) represents effective population size. The X-axis is the time-scale in million years ago (Ma).

Table S1 Detailed information of GenBank accession numbers and haplotypes (Hap) of *Cytb*, *c-Myc2*, *Rhod* and *Tyr* for all the samples used in this study. For the abbreviation of each population see Table 1.

Population	Sample ID	<i>Cytb</i>		<i>c-Myc2</i>		<i>Rhod</i>		<i>Tyr</i>	
		Hap	GenBank	Hap	GenBank	Hap	GenBank	Hap	GenBank
RW	RW-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-2	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-4	Hap37	KJ434224	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-5	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-6	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-7	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-8	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-11	Hap37	KJ434224	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-12	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-13	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-14	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-15	Hap37	KJ434224	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-16	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-17	Hap37	KJ434224	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-18	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-19	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-20	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-21	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-22	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-23	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RW-24	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
JJ	JJ-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-2	hap11	KJ434198	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-4	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	JJ-5	Hap27	KJ434214	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-6	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-7	hap12	KJ434199	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-8	Hap28	KJ434215	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
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	JJ-13	Hap36	KJ434223	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-14	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-15	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-16	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-17	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-18	Hap26	KJ434213	-	-	Hap1	KJ434286	Hap1	KJ434288
	JJ-19	Hap29	KJ434216	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-20	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	JJ-21	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	JJ-22	Hap42	KJ434229	-	-	Hap1	KJ434286	Hap1	KJ434288
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	ZB-2	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-3	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-4	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-5	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-6	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
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	ZB-10	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
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	ZB-12	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-13	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
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	ZB-17	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	ZB-18	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
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	GZ-12	Hap42	KJ434229	Hap22	KJ434284	Hap2	KJ434287	Hap1	KJ434288
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					Hap2	KJ434287			
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	QG-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
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QG-18	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
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	CD-3	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
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	CD-6	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
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			Hap4	KJ434266					
CD-19	Hap65	KJ434252	-	-	Hap1	KJ434286	Hap1	KJ434288	
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	PL-2	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
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	PL-11	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-12	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-13	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-14	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-15	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-16	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-17	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-18	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291

	PL-19	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	PL-20	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
DX	DX-1	Hap6	KJ434193	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-2	Hap19	KJ434206	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-4	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-5	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-6	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-7	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-8	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-11	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-12	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-13	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-14	Hap73	KJ434260	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-15	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-16	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-17	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	-	-
	DX-18	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-19	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-20	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	DX-21	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
YB	YB-1	Hap13	KJ434200	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	YB-2	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-3	Hap13	KJ434200	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	YB-4	Hap14	KJ434201	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	YB-5	Hap14	KJ434201	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-6	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-7	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-8	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-9	Hap13	KJ434200	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	YB-10	Hap13	KJ434200	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	YB-11	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-12	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	-	-
	YB-13	Hap74	KJ434261	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-14	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-15	Hap13	KJ434200	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	YB-16	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-17	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-18	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288

	YB-19	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-20	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-21	Hap75	KJ434262	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
						Hap2	KJ434287		
	YB-22	Hap13	KJ434200	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	YB-23	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-24	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-25	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	YB-26	Hap13	KJ434200	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
BJ	BJ-1	Hap42	KJ434229	Hap8	KJ434270	Hap1	KJ434286	Hap1	KJ434288
	BJ-2	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270			Hap2	KJ434289
	BJ-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	BJ-4	Hap53	KJ434240	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
			Hap8	KJ434270					
BJ-5	Hap42	KJ434229	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288	
			Hap16	KJ434278					
BJ-6	Hap42	KJ434229	Hap8	KJ434270	Hap1	KJ434286	Hap1	KJ434288	
XH	XH-1	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	XH-2	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LU	LU-1	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-2	Hap1	KJ434188	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-3	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-4	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-5	Hap1	KJ434188	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-6	Hap1	KJ434188	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-7	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-8	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-9	Hap1	KJ434188	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap18	KJ434280				
	LU-10	Hap2	KJ434189	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-11	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-12	Hap4	KJ434191	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap18	KJ434280				
	LU-13	Hap2	KJ434189	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
LU-14	Hap2	KJ434189	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288	
							Hap2	KJ434289	
LU-15	Hap5	KJ434192	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288	

	LU-16	Hap5	KJ434192	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap18	KJ434280				
	LU-17	Hap3	KJ434190	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap3	KJ434265				
	LU-18	Hap1	KJ434188	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-19	Hap2	KJ434189	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
	LU-20	Hap1	KJ434188	Hap3	KJ434265	Hap1	KJ434286	Hap1	KJ434288
SP	SP-1	Hap9	KJ434196	Hap1	KJ434263	Hap1	KJ434286	Hap2	KJ434289
	SP-2	Hap9	KJ434196	Hap15	KJ434277	Hap1	KJ434286	Hap2	KJ434289
				Hap16	KJ434278				
	SP-3	Hap43	KJ434230	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	SP-4	Hap43	KJ434230	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270			Hap2	KJ434289
	SP-5	Hap52	KJ434239	Hap11	KJ434273	Hap1	KJ434286	Hap1	KJ434288
				Hap9	KJ434271				
	SP-6	Hap10	KJ434197	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	SP-7	Hap9	KJ434196	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	SP-8	Hap9	KJ434196	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	SP-9	Hap9	KJ434196	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
SP-10	Hap10	KJ434197	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
							Hap2	KJ434289	
SP-11	Hap42	KJ434229	Hap11	KJ434273	Hap1	KJ434286	Hap1	KJ434288	
			Hap9	KJ434271			Hap2	KJ434289	
SP-12	Hap10	KJ434197	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
SP-13	Hap42	KJ434229	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288	
			Hap16	KJ434278			Hap2	KJ434289	
SP-14	Hap9	KJ434196	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
							Hap2	KJ434289	
NY	NY-1	Hap56	KJ434243	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap16	KJ434278				
	NY-2	Hap52	KJ434239	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288

	NY-3	Hap57	KJ434244	Hap16	KJ434278	Hap1	KJ434286	Hap1	KJ434288
				Hap17	KJ434279				
	NY-4	Hap55	KJ434242	Hap16	KJ434278	Hap1	KJ434286	Hap1	KJ434288
				Hap17	KJ434279				
	NY-5	Hap55	KJ434242	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	NY-6	Hap42	KJ434229	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
		Hap42		Hap16	KJ434278				
	NY-7		KJ434229	Hap16	KJ434278	Hap1	KJ434286	Hap1	KJ434288
				Hap17	KJ434279				
	NY-8	Hap55	KJ434242	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap17	KJ434279				
	NY-9	Hap42	KJ434229	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap16	KJ434278				
	NY-10	Hap55	KJ434242	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap16	KJ434278				
	NY-11	Hap56	KJ434243	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	NY-12	Hap56	KJ434243	Hap16	KJ434278	Hap1	KJ434286	Hap1	KJ434288
	NY-13	Hap42	KJ434229	Hap16	KJ434278	Hap1	KJ434286	Hap1	KJ434288
				Hap17	KJ434279				
	NY-14	Hap54	KJ434241	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
				Hap16	KJ434278				
BY	BY-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	BY-2	Hap42	KJ434229	Hap13	KJ434275	Hap1	KJ434286	Hap1	KJ434288
				Hap12	KJ434274				
	BY-3	Hap42	KJ434229	Hap8	KJ434270	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	BY-4	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	BY-5	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270			Hap2	KJ434289
	BY-6	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	BY-7	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	BY-8	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	BY-9	Hap41	KJ434228	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	BY-10	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289

	BY-11	Hap41	KJ434228	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270			Hap2	KJ434289
	BY-12	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	BY-13	Hap40	KJ434227	Hap10	KJ434272	Hap1	KJ434286	Hap1	KJ434288
				Hap11	KJ434273				
	BY-14	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	BY-15	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	BY-16	Hap40	KJ434227	Hap10	KJ434272	Hap1	KJ434286	Hap1	KJ434288
				Hap11	KJ434273				
	BY-17	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
								Hap2	KJ434289
	BY-18	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	BY-19	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
				Hap8	KJ434270				
	BY-20	Hap42	KJ434229	Hap1	KJ434263			Hap1	KJ434288
				Hap8	KJ434270	Hap1	KJ434286		
RC	RC-1	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-2	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-3	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-4	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-5	Hap66	KJ434253	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-6	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
	RC-7	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
NM	NM-1	Hap68	KJ434255	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
				Hap21	KJ434283				
	NM-2	Hap69	KJ434256	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
				Hap21	KJ434283				
	NM-3	Hap69	KJ434256	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-4	Hap69	KJ434256	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-5	Hap61	KJ434248	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-6	Hap58	KJ434245	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-7	Hap71	KJ434258	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-8	Hap68	KJ434255	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-9	Hap60	KJ434247	hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	NM-10	Hap69	KJ434256	Hap22	KJ434284	Hap2	KJ434287	Hap4	KJ434291
	NM-11	Hap69	KJ434256	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291

	NM-12	Hap68	KJ434255	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-13	Hap72	KJ434259	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-14	Hap70	KJ434257	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
	NM-15	Hap69	KJ434256	Hap21	KJ434283	Hap2	KJ434287	Hap4	KJ434291
NT	NT-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-2	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-4	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-5	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-6	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-7	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-8	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	NT-11	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
BQ	BQ-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-2	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-3	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-4	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-5	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-6	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-7	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-8	Hap39	KJ434226	-	-	Hap1	KJ434286	Hap1	KJ434288
	BQ-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-10	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-11	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-12	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-13	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-14	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	BQ-15	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
RD	RD-1	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	RD-2	Hap42	KJ434229	Hap5	KJ434267	-	-	Hap1	KJ434288
				Hap7	KJ434269				
	RD-3	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288
				Hap7	KJ434269				
	RD-4	Hap42	KJ434229	Hap7	KJ434269	Hap1	KJ434286	Hap1	KJ434288
RD-5	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288	
			Hap7	KJ434269					
RD-6	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288	
			Hap7	KJ434269					
LC	LC-1	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291

LC-2	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
			Hap20	KJ434282				
LC-3	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-4	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-5	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-6	Hap67	KJ434254	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-7	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
			Hap20	KJ434282				
LC-8	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-9	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-10	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-11	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-12	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-13	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-14	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-15	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-16	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291
LC-17	Hap68	KJ434255	Hap19	KJ434281	Hap2	KJ434287	Hap4	KJ434291

CM	CM-1	Hap42	KJ434229	Hap2	KJ434264	Hap1	KJ434286	Hap1	KJ434288
	CM-2	Hap36	KJ434223	Hap2	KJ434264	-	-	Hap1	KJ434288
	CM-3	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288
				Hap6	KJ434268				
	CM-4	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-5	Hap34	KJ434221	Hap15	KJ434277	Hap1	KJ434286	Hap1	KJ434288
	CM-6	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288
				Hap6	KJ434268				
	CM-7	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-8	Hap42	KJ434229	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288
				Hap6	KJ434268				
	CM-9	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-10	Hap42	KJ434229	Hap7	KJ434269	Hap1	KJ434286	Hap1	KJ434288
	CM-11	Hap33	KJ434220	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-12	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-13	Hap35	KJ434222	Hap5	KJ434267	Hap1	KJ434286	Hap1	KJ434288
				Hap6	KJ434268				
	CM-14	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-15	Hap32	KJ434219	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
	CM-16	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288
CM-17	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
CM-18	Hap8	KJ434195	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
CM-19	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	
CM-20	Hap42	KJ434229	Hap1	KJ434263	Hap1	KJ434286	Hap1	KJ434288	

Table S2 *Cytb* haplotype frequency, nucleotide diversity (π) and haplotype diversity (h) with standard deviation (s.d.) in each population. Haplotypes in bold are those shared between different populations, and the rest are the private haplotypes. See Table 1 for population abbreviations.

Population	<i>Cytb</i> clade	Haplotype (frequency)	π	h (s.d.)
BQ	E1	Hap39 (1); Hap42 (14)	0.00013	0.133 (0.112)
BD	E1	Hap38 (15); Hap42 (9)	0.00047	0.489 (0.057)
BY	E1	Hap40 (2); Hap41 (2); Hap42 (16)	0.00036	0.358 (0.126)
DQ	E1	Hap15 (14); Hap16 (1); Hap42 (8)	0.00056	0.530 (0.071)
DX	E1	Hap6 (1); Hap19 (1); Hap42 (18); Hap73 (1)	0.00076	0.267 (0.120)
GZ	E1	Hap30 (3); Hap31 (1); Hap42 (16)	0.00035	0.353 (0.123)
JJ	E1	hap11 (1); hap12 (1); Hap26 (1); Hap27 (1); Hap28 (1); Hap29 (1); Hap36 (1); Hap42 (15)	0.00069	0.545 (0.128)
CM	E1	Hap8 (1); Hap32 (1); Hap33 (1); Hap34 (1); Hap35 (1); Hap36 (1); Hap42 (14)	0.00067	0.521 (0.135)
NG	E1	Hap21 (1); Hap42 (21)	0.00009	0.091 (0.081)
NT	E1	Hap42 (11)	0	0
RD	E1	Hap42 (6)	0	0
RW	E1	Hap37 (4); Hap42 (20)	0.00028	0.290 (0.103)
XQ	E1	Hap42 (24)	0	0
YB	E1	Hap13 (22); Hap14 (2); Hap74 (1); Hap75 (1)	0.00064	0.289 (0.115)
BJ	E1	Hap42 (5)	0.00192	0.333 (0.215)
	E3	Hap53 (1)		
CD	E1	Hap17 (1); Hap20 (3); Hap42 (15)	0.00468	0.432 (0.126)
	W1	Hap65 (1)		
CN	E1	Hap18 (1); Hap42 (2)	0.00196	0.768 (0.080)
	E2	Hap46 (1); Hap47 (4); Hap49 (9); Hap50 (1); Hap51 (2)		
NY	E1	Hap42 (4)	0.00292	0.835 (0.062)
	E3	Hap52 (1); Hap54 (1); Hap55 (4); Hap56 (3); Hap57 (1)		
QG	E1	Hap7 (1); Hap22 (1); Hap23 (2); Hap24 (1); Hap25 (1); Hap42 (12)	0.00167	0.647 (0.120)
	E2	Hap44 (1); Hap45 (1)		
QS	E2	Hap48 (1); Hap49 (19)	0.0001	0.100 (0.088)
SP	E1	Hap9 (6); Hap10 (3); Hap42 (2)	0.00332	0.780 (0.085)
	E2	Hap43 (2)		
	E3	Hap52 (1)		
LU	E4	Hap1 (6); Hap2 (4); Hap3 (1); Hap4 (1); Hap5 (8)	0.00094	0.742 (0.058)
LC	W1	Hap67 (1); Hap68 (16)	0.00011	0.118 (0.101)
LL	W1	Hap59 (1); Hap62 (8); Hap63 (1); Hap68 (10)	0.00079	0.616 (0.067)
LN	W1	Hap68 (20)	0	0
PL	E1	Hap20 (1)	0.00432	0.100 (0.088)

	W1	Hap68 (19)		
RC	W1	Hap66 (1); Hap68 (6)	0.00027	0.286 (0.196)
XH	W1	Hap68 (2)	0	0
ZB	W1	Hap64 (1); Hap68 (19)	0.00010	0.100 (0.088)
NM	W1	Hap58 (1); Hap60 (1); Hap61 (1); Hap68 (3)	0.01109	0.892
	W2	Hap69 (6); Hap70 (1); Hap71 (1); Hap72 (1)		

π , nucleotide diversity; h (s.d.), haplotype diversity with standard deviation.

Table S3 Mean pairwise uncorrected p -distances (%) and pairwise Φ_{ST} values among *Cytb* sublineages. Above the diagonal are the Φ_{ST} values. Pairwise p -distances between and within *Cytb* lineages are shown below and at the diagonal, respectively.

<i>Cytb</i> sublineage	1	2	3	4	5	6
1 E1	0.24	0.83**	0.83**	0.91**	0.98**	0.98**
2 E2	0.62	0.23	0.69**	0.90**	0.98**	0.98**
3 E3	0.62	0.44	0.22	0.87**	0.97**	0.96**
4 E4	0.96	0.94	0.97	0.15	0.97**	0.97**
5 W1	4.35	4.29	4.26	4.29	0.25	0.94**
6 W2	4.33	4.27	4.24	4.27	1.96	0.32
7 outgroup	14.34	14.30	14.49	14.54	14.02	13.83

** denotes significance at $\alpha = 0.01$.

Table S4 PCR primer sets used in the study. T_m (°C) is the annealing temperature.

Locus	Abbreviation	T _m (°C)	Primer	Primer sequence	Reference
Mitochondrial cytochrome <i>b</i>	<i>Cytb</i>	55	Cybt-F	5'-TCCAGCCCGAAAATCTCAC-3'	This study
			Cybt-R	5'-TGCACGTAAGTCCGCTAG-3'	
Cellular myelocytomatosis intron 2	<i>c-Myc2</i>	61	CYMC5	5'-ATCRTYATHCAGGACTGTATGTGGAG-3'	1
			CYMC6	5'-GACCTSGGACTCGARCACTTGCG-3'	
Rhodopsin	<i>Rhod</i>	60	Rhod1A	5'-ACCATGAACGGAACAGAAGGYCC-3'	2
			Rhod1D	5'-GTAGCGAAGAARCCTTCAAMGTA-3'	
Tyrosinase	<i>Tyr</i>	60	Tyr1G	5'-TGCTGGGCRTCTCTCCARTCCCA-3'	2
			Tyr1B	5'-AGGTCCTCYTRAGGAAGGAATG-3'	

1. Chen, W., Bi, K. & Fu, J. Frequent mitochondrial gene introgression among high elevation Tibetan megophryid frogs revealed by conflicting gene genealogies. *Mol. Ecol.* **18**, 2856-2876 (2009).
2. Bossuyt, F., Brown, R. M., Hillis, D. M., Cannatella, D. C. & Milinkovitch, M. C. Phylogeny and biogeography of a cosmopolitan frog radiation: Late Cretaceous diversification resulted in continent-scale endemism in the family Ranidae. *Syst. Biol.* **55**, 579-594 (2006).

Table S5 Occurrence data of *N. parkeri* for the species distribution modelling.

Species	Longitude	Latitude
<i>Nanorana.parkeri</i>	87.12483	28.43992
<i>Nanorana.parkeri</i>	86.0351	28.30842
<i>Nanorana.parkeri</i>	89.07698	29.56162
<i>Nanorana.parkeri</i>	90.88817	30.70533
<i>Nanorana.parkeri</i>	92.96918	31.86978
<i>Nanorana.parkeri</i>	96.5952	31.26215
<i>Nanorana.parkeri</i>	84.30112	29.64092
<i>Nanorana.parkeri</i>	86.52375	29.4737
<i>Nanorana.parkeri</i>	94.23038	31.86577
<i>Nanorana.parkeri</i>	91.1014	29.91587
<i>Nanorana.parkeri</i>	91.71733	29.83608
<i>Nanorana.parkeri</i>	91.07197	30.46238
<i>Nanorana.parkeri</i>	90.44918	30.05708
<i>Nanorana.parkeri</i>	94.34748	29.32328
<i>Nanorana.parkeri</i>	94.72995	29.70042
<i>Nanorana.parkeri</i>	93.64725	29.14377
<i>Nanorana.parkeri</i>	95.37265	31.4893
<i>Nanorana.parkeri</i>	97.2747	30.21913
<i>Nanorana.parkeri</i>	92.2555	29.6932
<i>Nanorana.parkeri</i>	91.92038	28.91742
<i>Nanorana.parkeri</i>	90.38728	29.00807
<i>Nanorana.parkeri</i>	89.1461	27.789
<i>Nanorana.parkeri</i>	89.59408	28.90305
<i>Nanorana.parkeri</i>	88.7134	29.35972
<i>Nanorana.parkeri</i>	87.68697	29.07023
<i>Nanorana.parkeri</i>	93.1917	29.89865
<i>Nanorana.parkeri</i>	92.355383	31.665217
<i>Nanorana.parkeri</i>	90.98333	29.55
<i>Nanorana.parkeri</i>	91.78852	31.29663
<i>Nanorana.parkeri</i>	91.964	28.004
<i>Nanorana.parkeri</i>	85.245	29.373
<i>Nanorana.parkeri</i>	88.97	27.53
<i>Nanorana.parkeri</i>	97.719	29.874
<i>Nanorana.parkeri</i>	85.338	28.324