

The American Journal of Human Genetics, Volume 88

Supplemental Data

Ancient Voyaging and Polynesian Origins

**Pedro Soares, Teresa Rito, Jean Trejaut, Maru Mormina, Catherine Hill,
Emma Tinkler-Hundal, Michelle Braid, Douglas J. Clarke, Jun-Hun Loo,
Noel Thomson, Tim Denham, Mark Donohue, Vincent Macaulay, Marie Lin,
Stephen Oppenheimer, and Martin B. Richards**

Figure S1. Phylogeny of 157 Complete mtDNA Genomes from Haplogroup B4
Branch lengths were scaled using maximum likelihood and a time-dependent clock (ML analysis 1). Age estimates in years for complete genomes (CS) and synonymous mutations (SYN) are indicated for the most relevant nodes in this study. Synonymous mutations are underlined. Mutations are transitions at the nucleotide position indicated unless otherwise specified.

Table S1. Complete mtDNA Genomes Used in the Analysis

	Haplogroup	Region	Sub-region/group	Sequences	ML analysis				Notes	Reference
					1	2	3	4		
.	R11	China	Qingdao, Shandong	AY255163	x	x	x	x		Kong et al. 2003 ¹
.	R9b1a	Malaysia	Semelai	AY963579	x	x	x	x		Macaulay et al. 2005 ²
.	F3a	China	Yili, Xinjiang	AY255167	x	x	x	x		Kong et al. 2003 ¹
.	A6	China	Wuhan, Hubei	AY255166	x	x	x	x		Kong et al. 2003 ¹
.	Y2	China	Qijiang, Chongqing	DQ272121	x	x	x	x		Kong et al. 2006 ³
.	B5a1	China	Wuhan, Hubei	AY255145	x	x	x	x		Kong et al. 2003 ¹
.	B5b2a	China	Wuhan, Hubei	AY255179	x	x	x	x		Kong et al. 2003 ¹
1	B4f	Japan	Aichi	AP008788	x	x	x	x		Tanaka et al. 2004 ⁴
2	B4f	Japan	Tokyo	AP008262	x	x	x	x		Tanaka et al. 2004 ⁴
3	B4g	China	Zhanjiang, Guangdong	AY255133	x	x	x	x		Kong et al. 2003 ¹
4	B4g	Vietnam	Tay-Nung	VNM311	x	x	x	x		This study
5	B4e	Japan	Tokyo	AP008436	x	x	x	x		Tanaka et al. 2004 ⁴
6	B4d	Japan	Chiba	AP008492	x	x	x	x		Tanaka et al. 2004 ⁴
7	B4d1	Russia	Siberia: Buriat	AY519484	x	x	x	x		Starikovskaya et al. 2005 ⁵
8	B4d1	China	Qingdao, Shandong	AY255140	x	x	x	x		Kong et al. 2003 ¹
9	B4d1	China	Fengcheng, Liaoning	AY255135	x	x	x	x		Kong et al. 2003 ¹
10	B2	America	Native American	AY195749	x	x	x	x		Mishmar et al. 2003 ⁶
11	B2	America	Native American (Pinam)	AF347001	x	x	x	x		Ingman et al. 2000 ⁷
12	B4b1b	Japan	Aichi	AP008682	x	x	x	x		Tanaka et al. 2004 ⁴
13	B4b1b	Vietnam	Hanoi	VN016	x	x	x	x		This study (Trejaut/Taipei lab data)
14	B4b1b	Mongolia		DQ272119	x	x	x	x		Kong et al. 2006 ³
15	B4b1a	Russia	Siberia: Tubular	AY519494	x	x	x	x		Starikovskaya et al. 2005 ⁵
16	B4b1a2	Japan	Tokyo	AP008856	x	x	x	x		Tanaka et al. 2004 ⁴
17	B4b1a2	China	Zhanjiang, Guangdong	AY255170	x	x	x	x		Kong et al. 2003 ¹
18	B4b1a1	Japan	Tokyo	AP008900	x	x	x	x		Tanaka et al. 2004 ⁴
19	B4b1a1	Japan	Aichi	AP008594	x	x	x	x		Tanaka et al. 2004 ⁴
20	B4b1a1	Japan	Tokyo	AP008355	x	x	x	x		Tanaka et al. 2004 ⁴
21	B4c2	Thailand		AY289100	x	x	x	x		Ingman and Gyllensten 2003 ⁸
22	B4c2	Thailand		AY289101	x	x	x	x		Ingman and Gyllensten 2003 ⁸
23	B4c1c	Japan	Chiba	AP008450	x	x	x	x		Tanaka et al. 2004 ⁴
24	B4c1c	Japan	Aichi	AP008563	x	x	x	x		Tanaka et al. 2004 ⁴
25	B4c1a	Japan	Tokyo	AP008281	x	x	x	x		Tanaka et al. 2004 ⁴
26	B4c1a	Japan	Chiba	AP008470	x	x	x	x		Tanaka et al. 2004 ⁴
27	B4c1b	China	Fengcheng, Liaoning	AY255149	x	x	x	x		Kong et al. 2003 ¹
28	B4c1b	Japan	Chiba	AP008472	x	x	x	x		Tanaka et al. 2004 ⁴
29	B4c1b	Japan	Aichi	AP008570	x	x	x	x		Tanaka et al. 2004 ⁴
30	B4c1b	Japan	Tokyo	AP008899	x	x	x	x		Tanaka et al. 2004 ⁴
31	B4a*	Taiwan	Siraya	SL309	x	x	x	x		This study (Trejaut/Taipei lab data)
32	B4h	China	Fujian	Fuj4752	x	x	x	x		This study (Trejaut/Taipei lab data)
33	B4h	China	Fujian	FC076	x	x	x	x		This study (Trejaut/Taipei lab data)
34	B4a	Japan	Tokyo	AP008384	x	x	x	x		Tanaka et al. 2004 ⁴

35	B4a	Japan	Aichi	AP008567	x	x	x	x		Tanaka et al. 2004 ⁴
36	B4a2	Japan	Gifu	AP008257	x	x	x	x		Tanaka et al. 2004 ⁴
37	B4a2a	Indonesia	Banjarmasin (Borneo)	BAN3	x	x	x	x		This study
38	B4a2a	Taiwan	Yami	AJ842751	x	x	x	x		Trejaut et al. 2005 ⁹
39	B4a2a	Taiwan	Paiwan	AJ842750	x	x	x	x		Trejaut et al. 2005 ⁹
40	B4a2a	Taiwan	Saisiat	SA030	x	x	x	x		This study (Trejaut/Taipei lab data)
41	B4a1d	Vietnam	Kinh	V206	x	x	x	x		This study
42	B4a1d	Vietnam	Hanoi	VN014	x	x	x	x		This study (Trejaut/Taipei lab data)
43	B4a1c	Japan	Chiba	AP008521	x	x	x	x		Tanaka et al. 2004 ⁴
44	B4a1c	Japan	Aichi	AP008650	x	x	x	x		Tanaka et al. 2004 ⁴
45	B4a1c	Japan	Aichi	AP008889	x	x	x	x		Tanaka et al. 2004 ⁴
46	B4a1c	Japan	Tokyo	AP008912	x	x	x	x		Tanaka et al. 2004 ⁴
47	B4a1c	China	GuangXi	DQ272120	x	x	x	x		Kong et al. 2006 ³
48	B4a1c	Thailand	Taiwan workers	Thai107	x	x	x	x		This study (Trejaut/Taipei lab data)
49	B4a1c	Russia	Siberia: Tuvan	AY519495	x	x	x	x		Starikovskaya et al. 2005 ⁵
50	B4a1c	Russia	Siberia: Tofalar	AY519492	x	x	x	x		Starikovskaya et al. 2005 ⁵
51	B4a1c			AY195770	x	x	x	x		Mishmar et al. 2003 ⁶
52	B4a1c	China	Fujian	Fuj4547	x	x	x	x		This study (Trejaut/Taipei lab data)
53	B4a1c	Japan	Aichi	AP008661	x	x	x	x		Tanaka et al. 2004 ⁴
54	B4a1c	Japan	Tokyo	AP008412	x	x	x	x		Tanaka et al. 2004 ⁴
55	B4a1b	Japan	Aichi	AP008595	x	x	x	x		Tanaka et al. 2004 ⁴
56	B4a1b	Japan	Tokyo	AP008842	x	x	x	x		Tanaka et al. 2004 ⁴
57	B4a1b	Korea		AF346993	x	x	x	x		Ingman et al. 2000 ⁷
58	B4a1b	Japan	Aichi	AP008597	x	x	x	x		Tanaka et al. 2004 ⁴
59	B4a1b	Japan	Aichi	AP008640	x	x	x	x		Tanaka et al. 2004 ⁴
60	B4a1b	Japan	Tokyo	AP008415	x	x	x	x		Tanaka et al. 2004 ⁴
61	B4a1a	Taiwan	Ami	AJ842749	x	x				Trejaut et al. 2005 ⁹
62	B4a1a	Taiwan	Yami	AJ842747	x	x				Trejaut et al. 2005 ⁹
63	B4a1a	Taiwan	Atayal	AJ842746	x	x				Trejaut et al. 2005 ⁹
64	B4a1a	Taiwan	Tsou	TS039	x	x				This study (Trejaut/Taipei lab data)
65	B4a1a2	Taiwan	Ami	AJ842745	x	x				Trejaut et al. 2005 ⁹
66	B4a1a2	Taiwan	Ami	AJ842748	x	x				Trejaut et al. 2005 ⁹
67	B4a1a	Taiwan	Ami	AMI12	x	x				This study (Trejaut/Taipei lab data)
68	B4a1a	Indonesia	Manado	MND36	x		x			This study
69	B4a1a3	Taiwan	Ami	AM025	x	x				This study (Trejaut/Taipei lab data)
70	B4a1a3	Taiwan	Siraya	SL049	x	x				This study (Trejaut/Taipei lab data)
71	B4a1a3	Taiwan	Ami	AJ842744	x	x				Trejaut et al. 2005 ⁹
72	B4a1a3	East Malaysia	Kota Kinabalu (Borneo)	KK144	x		x			This study
73	B4a1a3	Indonesia	Sumba	WA194	x		x			This study
74	B4a1a	Philippines		GQ119021	x		x			Tabbada et al. 2010 ¹⁰
75	B4a1a	East Malaysia	Kota Kinabalu (Borneo)	KK141	x		x			This study
76	B4a1a	Philippines		FIL18	x		x			This study
77	B4a1a	Philippines		FIL59	x		x			This study
78	B4a1a	Indonesia	Banjarmasin (Borneo)	BAN75	x		x			This study
79	B4a1a	Indonesia	Ambon	AMB20	x		x			This study
80	B4a1a	Indonesia	Banjarmasin (Borneo)	BAN39	x		x			This study

81	B4a1a	Indonesia	Mataran	MTR62	x		x			This study
82	B4a1a	Indonesia	Toraja	TOR31	x		x			This study
83	B4a1a	Indonesia	Java	IN101	x		x			This study(Trejaut/Taipei lab data)
84	B4a1a	Indonesia	Manado	MND37	x		x			This study
85	B4a1a	New Guinea	Trobriand Islands	DQ372871						Pierson et al. 2006 ¹¹
86		Philippines	Mindanao	GQ119029						Tabbada et al. 2010 ¹⁰
87	B4a1a1	Indonesia	Ujung Pandang	UJP18	x		x			This study
88	B4a1a1	Papua New Guinea	North Coast	AY289076	x					Ingman and Gyllensten 2003 ⁸
89	B4a1a1	Micronesia	Majuro Atoll	DQ372877	x					Pierson et al. 2006 ¹¹
90	B4a1a1	Micronesia	Kapingamarangi Atoll	DQ372874	x					Pierson et al. 2006 ¹¹
91	B4a1a1	Micronesia	Kapingamarangi Atoll	DQ372875	x					Pierson et al. 2006 ¹¹
92	B4a1a1	Bismarch Archipelago	Lihir Island	L627	x			x		This study
93	B4a1a1	Bismarch Archipelago	Lihir Island	L703	x			x		This study
94	B4a1a1	Bismarch Archipelago	Lihir Island	L626	x			x		This study
95	B4a1a1	New Guinea	Trobriand Islands	DQ372873	x					Pierson et al. 2006 ¹¹
96	B4a1a1a	Indonesia	Ambon	AMB39	x		x			This study
97	B4a1a1a	Indonesia	Mataran	MTR12	x		x			This study
98	B4a1a1a	Indonesia	Toraja	TOR16	x		x			This study
99	B4a1a1a	Indonesia	Mataran	MTR8	x		x			This study
100	B4a1a1a	Indonesia	Ujung Pandang	UJP30	x		x			This study
101	B4a1a1a	Indonesia	Manado	MND21	x		x			This study
102	B4a1a1a	Indonesia	Ambon	AMB108	x		x			This study
103	B4a1a1a	Indonesia	Palangkaraya (Borneo)	PRY35	x		x			This study
104	B4a1a1a	Indonesia	Ambon	AMB12	x		x			This study
105	B4a1a1a	Bismarch Archipelago	Kavieng	K65	x					This study
106	B4a1a1a	Indonesia	Banjarmasin (Borneo)	BAN41	x		x			This study
107	B4a1a1a	Bismarch Archipelago	Kavieng	K73	x			x		This study
108	B4a1a1a	West Papua		IR77	x				dHPLC + CS	This study
109	B4a1a1a	Papua New Guinea	Madang	C12991	x				dHPLC + CS	This study
110	B4a1a1a	Papua New Guinea	North Coast	AY289077	x					Ingman and Gyllensten 2003 ⁸
111	B4a1a1a	Papua New Guinea	Madang	C7191	x				Partly dHPLC	This study
112	B4a1a1a	Papua New Guinea	Madang	C11191	x				Partly dHPLC	This study
113	B4a1a1a	Papua New Guinea	North Coast	AY289080	x					Ingman and Gyllensten 2003 ⁸
114	B4a1a1a	Papua New Guinea	Madang	M4890	x				dHPLC + CS	This study
115	B4a1a1a	Samoa		AF347007	x					Ingman et al. 2000 ⁷
116	B4a1a1a	Vanuatu	Banks and Torres	BT5					Partly dHPLC	This study
117	B4a1a1a	Vanuatu	Banks and Torres	BT15					Partly dHPLC	This study
118	B4a1a1a	Vanuatu	Banks and Torres	BT86					Partly dHPLC	This study
119	B4a1a1a	Vanuatu	Banks and Torres	BT21					Partly dHPLC	This study
120	B4a1a1a	Papua New Guinea	Madang	M0591	x				Partly dHPLC	This study
121	B4a1a1a	Vanuatu	Espiritu Santo	DQ372878	x					Pierson et al. 2006 ¹¹
122	B4a1a1a	Vanuatu	Port Olry	PO49					Partly dHPLC	This study
123	B4a1a1a1	Papua New Guinea	North Coast	AY289083						Ingman and Gyllensten 2003 ⁸
124	B4a1a1a1	Bismarch Archipelago	Lihir Island	L712	x					This study
125	B4a1a1a1	Papua New Guinea	South Highlands	KZ522	x					This study
126	B4a1a1a1	Papua New Guinea	South Highlands	KZ517	x					This study

127	B4a1a1a1	Papua New Guinea	South Highlands	KZ528	x					This study
128	B4a1a1a1	Bismarch Archipelago	Kavieng	K95	x			x		This study
129	B4a1a1a1	Bismarch Archipelago	Kavieng	K86	x			x		This study
130	B4a1a1a1	Bismarch Archipelago	Kavieng	K38	x			x		This study
131	B4a1a1a1	Bismarch Archipelago	Kavieng	K59	x			x		This study
132	B4a1a1a1	Bismarch Archipelago	Kavieng	K56	x			x		This study
133	B4a1a1a1	Bismarch Archipelago	Kavieng	K11	x			x		This study
134	B4a1a1a1	Bismarch Archipelago	Lihir Island	L735	x			x		This study
135	B4a1a1a1	Bismarch Archipelago	Lihir Island	L623	x			x		This study
136	B4a1a1a1	Bismarch Archipelago	Lihir Island	L746	x			x		This study
137	B4a1a1a1	Vanuatu	Banks and Torres	BT80					dHPLC + CS	This study
138	B4a1a1a1	Vanuatu	Port Olry	PO76					Partly dHPLC	This study
139	B4a1a1a1	Vanuatu	Banks and Torres	BT79					Partly dHPLC	This study
140	B4a1a1a1	Samoa		AY289093						Ingman and Gyllensten 2003 ⁸
141	B4a1a1a1	Cook Islands	Atiu	AY289069						Ingman and Gyllensten 2003 ⁸
142	B4a1a1a	Bismarch Archipelago	Kavieng	K91	x			x		This study
143	B4a1a1a	Bismarch Archipelago	Kavieng	K25	x			x		This study
144	B4a1a1a	Bismarch Archipelago	Kavieng	K16	x			x		This study
145	B4a1a1a	Bismarch Archipelago	Kavieng	K53	x			x		This study
146	B4a1a1a	Bismarch Archipelago	Kavieng	K68	x			x		This study
147	B4a1a1a	Bismarch Archipelago	Kavieng	K82	x			x		This study
148	B4a1a1a	Bismarch Archipelago	Kavieng	K27	x			x		This study
149	B4a1a1a	Bismarch Archipelago	Kavieng	K9	x			x		This study
150	B4a1a1a	Samoa		AY289094						Ingman and Gyllensten 2003 ⁸
151	B4a1a1a	Bougainville		AY963574	x					Macaulay et al. 2005 ²
152	B4a1a1a	Vanuatu	Espiritu Santo	DQ372881						Pierson et al. 2006 ¹¹
153	B4a1a1a	Vanuatu	Banks and Torres	BT62					Partly dHPLC	This study
154	B4a1a1a	Vanuatu	Port Olry	PO44					Partly dHPLC	This study
155	B4a1a1a	Cook Islands	Atiu	AY289068						Ingman and Gyllensten 2003 ⁸
156	B4a1a1a	Tonga		DQ372886						Pierson et al. 2006 ¹¹
157	B4a1a1a	Tonga		AY289102						Ingman and Gyllensten 2003 ⁸

Haplogroup, region, sub-region or ethnic group are indicated where the information is available. References and accession numbers for published sequences are indicated. The inclusion of the sequences in each of the four ML analyses is indicated. Partial dHPLC refers to mtDNA genomes whose variation was partially assessed through dHPLC with only a portion sequenced. dHPLC + CS refers to genomes initially generated in the same way but then completely sequenced.

Table S2. Control-Region Data for B4a and Additional Coding-Region Markers Typed in the Laboratories in Leeds and Taipei

Samples and HVS-I variants from CRS	Haplogroup	<i>n</i>	10238	6719	12239	15746	14022	Complete sequences and notes
Leeds Laboratory								
Taiwan – Ami (<i>n</i>=31)								
189 217 261	B4a1a	1	ND	1	1	1	0	
189 217 261 311	B4a1a	5	ND	1	1	1	0	Seq. 67
Taiwan – Atayal (<i>n</i>=18)								
189 217 261 324	B4a2a	2	ND	ND	ND	ND	ND	
154 189 217 261 324	B4a2a	1	ND	ND	ND	ND	ND	
Taiwan – Paiwan (<i>n</i>=21)								
189 217 261	B4a1a	2	ND	1	1	1	0	
189 217 261 272 324	B4a2a	3	ND	ND	ND	ND	ND	
189 217 261 272 288 324	B4a2a	1	ND	ND	ND	ND	ND	
Philippines – Undetermined (<i>n</i>=61)								
189 217 261	B4a1a	4	ND	1	1	1	0	Seq. 76
189 217 261 293	B4a1a	2	ND	1	1	1	0	
092 189 217 261 293	B4a1a	5	ND	1	1	1	0	Seq. 77
Indonesia – Alor (<i>n</i>=100)								
189 217 261	B4a1a	3	ND	1	1	1	0	
189 217 247 261	B4a1a1a	2	ND	1	1	1	ND	
Indonesia – Ambon (<i>n</i>=44)								
189 217 261	B4a*	1	0	ND	ND	ND	ND	Seq. 79
189 217 261	B4a1a	2	ND	1	1	1	0	
189 217 223 261	B4a1a	1	ND	1	1	1	0	
189 217 223 261 325	B4a1a	1	ND	1	1	1	0	
189 217 261 278	B4a1a	1	ND	1	1	1	0	Seq. 96, 102
189 217 247 261	B4a1a	5	ND	1	1	1	0	
189 217 247 261 362	B4a1a1a	1	ND	1	1	1	ND	Seq. 104
Indonesia – Bali (<i>n</i>=69)								
108 189 217 261	B4a1a	1	ND	1	1	1	0	
Indonesia – Banjarmasin, Borneo (<i>n</i>=89)								
189 217 261	B4a1a	5	ND	1	1	1	0	Seq. 78
178 189 217 261	B4a1a	2	ND	1	1	1	0	Seq. 80
189 217 247 261	B4a1a1a	1	ND	1	1	1	0	
093 189 217 247 261	B4a1a1a	1	ND	1	1	1	0	Seq. 106
189 217 261 324	B4a2a	1	ND	ND	ND	ND	ND	Seq. 37
Brunei (<i>n</i>=30)								
189 217 261	B4a1a	2	ND	1	1	1	0	
East Malaysia – Kota Kinabalu, Borneo (<i>n</i>=76)								
189 217 261	B4a1a	4	ND	1	1	1	0	Seq. 75
189 217 223 261	B4a1a	3	ND	1	1	1	0	Seq. 72
092 189 223 217 261	B4a1a	1	ND	1	1	1	0	
Indonesia – Manado, Sulawesi (<i>n</i>=89)								
189 217 261	B4a1a	1	ND	1	1	1	0	Seq. 84

189 217 261 288	B4ala	1	ND	1	1	1	0	
189 217 261 311	B4ala	1	ND	1	1	1	0	Seq. 68
189 217 247 261	B4alala	1	ND	1	1	1	ND	Seq. 101
Indonesia – Mataram, Lombok (n=74)								
189 217 261	B4ala	2	ND	1	1	1	0	Seq. 81
189 217 261 400	B4ala	1	ND	1	1	1	0	
189 217 247 261	B4alala	3	ND	1	1	1	ND	Seq. 97, 99
Indonesia – Palembang, Sumatra (n=37)								
189 261	B4a*	1	0	ND	ND	ND	ND	
Indonesia – Padang, Sumatra (n=25)								
189 217 261	B4ala	2	ND	1	1	1	0	
Indonesia – Palangkaraya, Borneo (n=112)								
189 217 261	B4ala	4	ND	1	1	1	0	
093 189 217 261	B4ala	1	ND	1	1	1	0	
189 217 223 261	B4ala	2	ND	1	1	1	0	
189 217 247 261	B4alala	1	ND	1	1	1	ND	Seq. 103
189 217 261 324	B4a2a	3	ND	ND	ND	ND	ND	
Indonesia – Toraja, Sulawesi (n=64)								
189 217 261	B4ala	3	ND	1	1	1	0	Seq. 82
189 217 261 311	B4ala	1	ND	1	1	1	0	
189 217 247 261	B4alala	5	ND	ND	ND	ND	ND	Seq. 98
Indonesia – Ujung Padang, Sulawesi (n=46)								
189 217 261	B4ala	3	ND	1	1	1	0	
189 217 223 261 335	B4ala	1	ND	1	1	1	0	
189 217 261	B4alal	1	ND	1	1	1	1	Seq. 87
189 217 247 261	B4alala	3	ND	ND	ND	ND	ND	Seq. 100
Indonesia – Sumba								
188 189 217 223 261 355	1	1	1	1	1	1	0	Seq. 73
Indonesia – West Papua (n=178)								
189 217 261	B4alal	1	ND	1	1	1	1	
189 217 247 261	B4alala	2	ND	1	1	1	ND	
189 217 247 255 261	B4alala	1	ND	1	1	1	ND	Seq. 108
Papua New Guinea – Madang (n=163)								
189 217 261	B4alal	9	ND	1	1	1	1	
086 189 217 261	B4alal	2	ND	1	1	1	1	
189 217 247 261	B4alala	23	ND	1	1	1	ND	Seq. 109, 111, 112, 114, 120
189 217 247 260 261	B4alala	1	ND	1	1	1	ND	
189 217 247 261 293C	B4alala	1	ND	1	1	1	ND	
124 189 217 247 261 293C	B4alala	2	ND	1	1	1	ND	
189 217 247	B4alala	1	ND	1	1	1	ND	
189 217 247 260 261	B4alala	1	ND	1	1	1	ND	
189 217 261	B4a*	1	0	0	0	0	ND	
Papua New Guinea – Southern Highlands (n=17)								
189 217 247 249 261	B4alala	1	ND	1	1	1	ND	Seq. 126

126 189 217 247 261	B4alala	1	ND	1	1	1	ND	Seq. 125
189 217 247 261 311	B4alala	1	ND	1	1	1	ND	Seq. 127
Papua New Guinea – Port Moresby (n= 114)								
189 217 261	B4alal	1	ND	1	1	1	1	
189 217 260 261	B4alal	1	ND	1	1	1	1	
189 217 261 274	B4alal	2	ND	1	1	1	1	
189 217 247 261	B4alal	11	ND	1	1	1	1	
166C 189 247 261	B4alala	1	ND	ND	ND	ND	ND	
189 217 247 261 289	B4alala	1	ND	ND	ND	ND	ND	
Bismarck Archipelago – Kavieng (n=83)								
189 217 261 311	B4alal	1	ND	1	1	1	1	
051 189 214 217 261	B4alal	1	ND	1	1	1	1	
189 217 247 261	B4alala	21	ND	1	1	1	ND	Seq. 133, 142, 143, 144, 145, 146, 147, 149
148 189 217 261	B4alala	1	ND	1	1	1	ND	Seq. 132
189 217 247 261 311	B4alala	10	ND	1	1	1	ND	Seq. 128, 130, 131
066 189 247 261 311	B4alala	1	ND	1	1	1	ND	
093 189 217 247 261 311	B4alala	3	ND	1	1	1	ND	
189 217 247 311	B4alala	1	ND	1	1	1	ND	
189 217 247 261 311 319	B4alala	1	ND	1	1	1	ND	Seq. 129
093 189 217 247 261	B4alala	2	ND	1	1	1	ND	Seq. 107
157 189 217 247 261	B4alala	1	ND	1	1	1	ND	
188 189 217 247 261	B4alala	2	ND	1	1	1	ND	
189 217 223 247 261	B4alala	2	ND	1	1	1	ND	
189 217 233 247 261	B4alala	2	ND	1	1	1	ND	Seq. 148
189 217 247 261 292	B4alala	1	ND	1	1	1	ND	
189 217 247 261 302	B4alala	1	ND	1	1	1	ND	
189 217 247 261 362	B4alala	2	ND	1	1	1	ND	Seq. 105
189 217 247 362	B4alala	1	ND	1	1	1	ND	
189 217 247 390	B4alala	1	ND	1	1	1	ND	
Bismarck Archipelago – Lihir Island (n=94)								
189 217 261	B4alal	10	ND	1	1	1	1	Seq. 93
084 189 217 261	B4alal	1	ND	1	1	1	1	
189 217 222 261	B4alal	24	ND	1	1	1	1	
084 189 217 222 261	B4alal	5	ND	1	1	1	1	Seq. 92
189 217 222 261 302	B4alal	2	ND	1	1	1	1	
129 189 217 261	B4alal	1	ND	1	1	1	1	Seq. 94
189 217 247 261 292	B4alala	3	ND	1	1	1	ND	Seq. 134, 135
189 217 247 261 302	B4alala	1	ND	1	1	1	ND	Seq. 136
189 217 239 247 261 274	B4alala	3	ND	1	1	1	ND	Seq. 124
Solomon Islands (n=21)								
189 217 247 261	B4alala	4	ND	1	1	1	ND	
189 217 247 261 311	B4alala	3	ND	1	1	1	ND	
Vanuatu – Banks and Torres (n=76)								
189 217 247 261	B4alala	7	ND	1	1	1	ND	Seq. 116, 117, 118, 119, 137, 153
189 217 219T 247 261	B4alala	2	ND	1	1	1	ND	Seq. 139

189 194C 217 219T 247 261	B4alala	1	ND	1	1	1	ND	
189 217 219T 247 261 345	B4alala	1	ND	1	1	1	ND	
Vanuatu – Port Olry (n=43)								
189 217 247 261	B4alala	18	ND	ND	ND	ND	ND	Seq.122, 138, 154
189 194C 217 247 261	B4alala	2	ND	ND	ND	ND	ND	
189 217 242 247 294	B4alala	1	ND	ND	ND	ND	ND	
189 217 247 261 362	B4alala	1	ND	ND	ND	ND	ND	
189 217 247 294	B4alala	1	ND	ND	ND	ND	ND	
Cook Islands (n=19)								
189 217 247 261	B4alala	15	ND	ND	ND	ND	ND	
189 217 247 261 294	B4alala	1	ND	ND	ND	ND	ND	
126 189 217 247 261	B4alala	1	ND	ND	ND	ND	ND	
126 189 217 261	B4alala	2	ND	ND	ND	ND	ND	Reversion 16247?
Vietnam (n=397)								
189 217 261	B4a1*	2	1	0	0	0	ND	
140 189 217 261	B4a1*	1	1	0	0	0	ND	
189 217 219 261 286 355	B4a*	1	0	0	0	0	ND	
189 217 219 261 286	B4a*	1	0	0	0	0	ND	
129 189 217 261 311	B4a*	2	0	0	0	0	ND	
189 217 261 294	B4a*	1	0	0	0	0	ND	
Thailand (n=132)								
093 188 189 214 217 261	B4a*	1	0	0	0	0	ND	
Taipei Laboratory								
China – Fujian (n=149)								
189 217 261	B4a*	1	0	0	ND	ND	ND	
129 189 261	B4h	1	0	0	0	0	0	Seq. 32
189 217 261 299	B4a*	1	0	0	ND	ND	ND	
93 189 217 261	B4a*	1	0	0	ND	ND	ND	
189 217 261	B4a1*	1	1	0	0	0	0	Seq. 52
154 189 217 240 261	B4a1*	1	1	ND	ND	ND	0	
93 189 217 261 311	B4a1*	1	1	0	ND	ND	ND	
Taiwan – Ami (n=98)								
189 217 261	B4ala	18	1	1	ND	ND	0	Seq. 65, 69
189 217 261 274	B4ala	6	1	1	ND	ND	0	Seq. 66
189 217 261 311	B4ala	8	1	1	ND	ND	0	
93 189 217 223 261	B4ala	1	1	1	1	1	0	Seq. 71
94 189 217 261	B4ala	10	1	1	1	1	0	Seq. 61
94 189 217 261 326C	B4ala	1	1	1	ND	ND	0	
Taiwan – Atayal (n=108)								
77 189 217 261	B4ala	3	1	1	ND	ND	0	
129 189 217 261	B4ala	1	1	1	1	1	0	Seq. 63
154 189 217 261 324	B4a2a	1	0	ND	ND	ND	0	
Taiwan – Hakka (n=74)								
189 217 240 261	B4a*	1	0	0	ND	ND	ND	
189 217 261 299	B4a*	1	0	0	ND	ND	ND	
189 213 217 261 295 299	B4a*	1	0	0	ND	ND	ND	
189 217 261 304	B4a*	1	0	0	ND	ND	ND	
217 261 299	B4a*	1	0	0	ND	ND	ND	
93 189 217 261	B4a*	2	0	0	ND	ND	ND	
189 217 261 324	B4a2a	1	0	0	ND	ND	ND	

Taiwan – Minnan (n=173)								
189 217 261 324	B4a2a	1	0	0	ND	ND	ND	
189 217 234 261	B4a*	2	0	0	ND	ND	ND	
129 189 217 261	B4a*	1	0	0	ND	ND	ND	
129 189 217 261 356	B4a*	1	0	0	ND	ND	ND	
189 213 217 235 242 261 292 301	B4a*	1	0	0	ND	ND	ND	
189 217 261	B4a*	2	0	0	ND	ND	ND	
51 129 189 217 261 354	B4a*	1	0	0	ND	ND	ND	
Taiwan – Paiwan (n=55)								
189 217 261 272 324	B4a2a	9	0	0	0	0	0	Seq. 39
Taiwan – Pazeh (n=65)								
189 217 221 240 261	B4a1*	2	1	0	ND	ND	0	
154 189 217 261 324	B4a2a	1	0	0	ND	ND	ND	
129 189 217 261 309	B4a*	1	0	0	ND	ND	ND	
136 182 183 189 217	B4a*	1	0	0	ND	ND	ND	
Taiwan – Puyuma (n=52)								
189 217 261 272 324	B4a2a	2	ND	0	ND	ND	ND	
Taiwan - Rukai (n=51)								
189 217 261	B4a1a	1	1	1	ND	ND	0	
189 217 261 274	B4a1a	2	1	1	ND	ND	0	
189 217 261 272 324	B4a2a	5	ND	0	ND	ND	ND	
Taiwan – Saisiat (n=64)								
154 189 217 261	B4a2a	1	0	0	ND	ND	ND	
154 189 217 261 324	B4a2a	1	0	0	ND	ND	0	Seq. 40
Taiwan – Siraya (n=364)								
129 189 217 261	B4a*	3	0	ND	ND	ND	ND	
129 189 217 261 287	B4a*	1	0	ND	ND	ND	ND	Seq. 31
129 189 217 261 356	B4a*	1	0	ND	ND	ND	ND	
189 217 261	B4a1a	1	1	1	ND	ND	0	
189 217 261 311	B4a1a	1	1	1	ND	ND	0	
129 189 217 261	B4a1a	1	1	1	ND	ND	0	
129 189 217 261 311 325	B4a1a	1	1	ND	ND	ND	0	
168 189 217 261 311	B4a1a	1	1	1	ND	ND	0	
189 217 223 261	B4a1a	3	1	1	ND	ND	0	Seq. 70
189 217 261 274	B4a1a	2	1	1	ND	ND	0	
93 189 217 261 362	B4a1a	1	1	ND	ND	ND	0	
189 217 261 324	B4a2a	12	0	ND	ND	ND	ND	
129 189 217 261 324	B4a2a	6	0	ND	ND	ND	ND	
189 217 261 272 324	B4a2a	1	0	ND	ND	ND	ND	
Taiwan – Toroko (n=53)								
154 189 217 261 324	B4a2a	5	0	ND	ND	ND	ND	
Taiwan – Tsou (n=60)								
189 217 261	B4a1a	6	1	1	ND	ND	0	Seq. 64
Taiwan – XinMen (n=38)								
189 217 261	B4a1*	6	0	0	ND	ND	ND	
Taiwan – Yami (n=79)								
189 217 261 360A	B4a1a	9	1	1	1	1	0	Seq. 62
189 217 261 324	B4a2a	1	0	0	ND	ND	ND	
129 189 217 261 324	B4a2a	12	0	0	ND	ND	0	Seq. 38
Indonesia – Java (n=228)								
189 217 261	B4a1*	1	1	0	ND	ND	ND	Seq. 83
93 189 217 261	B4a1*	3	1	0	ND	ND	0	
189 217 261	B4a1a	3	1	1	ND	ND	0	

129 189 217 261	B4a1a	1	1	1	ND	ND	0	
189 217 223 261	B4a1a	1	1	1	ND	ND	0	
Indonesia (unspecified) (n=32)								
189 217 261	B4a1a	1	1	1	ND	ND	0	
189 217 261 362	B4a1a	1	1	1	ND	ND	0	
Indonesia – Kalimantan (n=42)								
189 217 261	B4a1a	2	1	1	ND	ND	0	
Indonesia – Sumatra (n=29)								
189 217 261	B4a1a	2	1	1	ND	ND	0	
Indonesia – Sulawesi (n=31)								
168 189 217 261 311	B4a1*	1	1	0	ND	ND	0	
189 217 261	B4a1a	1	1	1	ND	ND	0	
Indonesia – Nusa Tenggara (n=2)								
93 217 261	B4a1a	1	1	1	ND	ND	0	
Indonesia – Timor (n=33)								
189 217 261	B4a1a	1	1	1	ND	ND	0	
Thailand (n=78)								
189 213 217 261 292	B4a*	1	0	0	0	0	0	
93 188 189 214 217 261	B4a1*	1	1	0	0	0	0	Seq. 48
Vietnam – Hanoi (n=58)								
189 217 219 261 286	B4a*	1	0	0	ND	ND	0	
189 217 261 274 348	B4a1*	1	1	0	ND	ND	0	
048 189 217 261	B4a1*	1	1	0	0	0	0	Seq. 41
189 217 261	B4a1*	1	1	0	0	0	0	Seq. 42

Typing is scored as “0” meaning that the position carries the same nucleotide as the reference sequence, “1” meaning that the nucleotide at that position differs from the reference sequence and “ND” meaning the sample was not tested at that position. HVS-I sequence types are indicated as variant positions from the reference sequence, less 16,000, with transversions indicated by a suffix. Numbers of complete sequences in the last column refer to the numbering in Table S1 and Figure S1.

Table S3. Age Estimates with Associated 95% Confidence Limits of B4a1a in ISEA and Taiwan, using ML (Maximum Likelihood) with the Complete Genome Clock, and ρ with Three Different Molecular Clocks, Two of Them with Independent Sources of Variation (Control-Region and Synonymous Clocks)

	Overall (ML1¹)	Taiwan (ML2¹)	ISEA (ML3¹)
Maximum likelihood	8450 (6700; 10,250)	8250 (5100;11,450)	8250 (6000; 10,550)
Complete genome clock, ρ	9700 (5000;14,500)	7900 (5500;10,350)	8000 (5600;10,400)
Control region, ρ	10,700 (4850; 16,550)	9750 (1150; 18,350)	10,850 (4000 ; 17,700)
Synonymous, ρ	12,750 (1000; 24,500)	10,400 (6800;13,950)	10,750 (7300;14,200)

¹ML1, ML2 and ML3 refer to the independent ML (maximum likelihood) analyses described above. Analyses exclude the Pacific data, since the high frequency of B4a1a1a (due to founder effects) would bias the results.

Table S4. HVS-I Variation of B4a1a in Taiwan and ISEA using ρ , Haplotype Diversity and π

Region	<i>n</i>	Age estimate (years) and 95% CI¹	Haplotype diversity	π
Taiwan²	82	9750 (1150; 18,350)	0.732	1.055
Philippines	73	9150 (2250; 16,100)	0.606	1.007
Indonesia/East Malaysia	110	11,800 (2800; 20,850)	0.745	1.270
ISEA³	183	10,850 (4000; 17,700)	0.709	1.213
Overall	275	10,700 (4850; 16,550)		

¹Confidence intervals

²Excluding the Yami, due to their probable recent ancestry in the Philippines

³ISEA (Island Southeast Asia) includes Indonesia/East Malaysia and the Philippines.

Table S5. Pooled Founder Ages, with Associated 95% Confidence Intervals, using the *f_I* Criterion, from Taiwan into ISEA and Vice Versa, using ρ and a Control-Region Clock (HVS-I), a Synonymous Mutation Clock (SYN) and a Time-Dependent Complete Genome Clock (CS)

	Taiwan to ISEA	ISEA to Taiwan
HVS-I	8170 (2750; 13,600)	5700 (0; 11,600)
SYN	9750 (2450; 17,100)	8650 (2700; 14,650)
CS	7150 (3700; 10,650)	6300 (3450; 9150)

Table S6. Age Estimates and Diversity Measures of Paragroup B4a1a1* (*i.e.*, the Clade B4a1a1 but Excluding the Polynesian Motif-Derived Subclade, B4a1a1a) in the Pacific, using the Control-Region Variation between Positions 16051 and 16400

Region	<i>n</i>	Age estimate (years)	95% CI ¹ (years)	Haplotype diversity	π
North coast of New Guinea ²	24	2800	(0; 6600)	0.292	0.331
Bismarck Archipelago	79	12,250	(0; 25,650)	0.732	1.104
Bougainville	15	6650	(500, 12,800)	0.604	0.781
Solomon Islands	33	9600	(0; 20,200)	0.714	0.981
Polynesia	15	4400	(0; 11,350)	0.420	0.200
Overall	166	8800	(1900; 15,700)		

¹Confidence interval

²Pooled data from Madang, Sepik Province and Karkar Island

Table S7. Age Estimates (using ρ and the HVS-I Molecular Clock) and Diversity Measures of B4a1a1a in Indonesia and the Pacific, using the Control-Region Variation between Positions 16051 and 16400

Region	<i>n</i>	Age estimate using ρ (years) and 95% CI ¹	Haplotype diversity	π
Indonesia	34	3450 (250; 6600)	0.360	0.405
North coast of New Guinea ²	62	5400 (1600; 9200)	0.393	0.624
Bismarck Archipelago	290	12,000 (5350; 18,650)	0.781	1.349
Bougainville	89	9500 (2550; 16,400)	0.700	1.082
Solomon Islands	130	5150 (0; 10,500)	0.494	0.566
South coast of New Guinea	16	6650 (500; 12,800)	0.578	0.781
Vanuatu	37	4950 (350; 9550)	0.260	0.571
Polynesia	114	4350 (2050; 6650)	0.411	0.516
Madagascar	35	1900 (0; 4200)	0.160	0.225
Overall Near Oceania ³	587	9150 (4750; 13,550)		
Overall	807	7700 (4300; 11,100)		

¹Confidence interval

²Pooled data from Madang, Sepik Province and Karkar Island

³Pooled data of North Coast of New Guinea, Bismarck Archipelago, Bougainville, Solomon Islands and South Coast of New Guinea

Table S8. Pooled Founder Age of B4a1a1a (the Polynesian Motif-Derived Clade) Founders into Remote Oceania, Calculated Separately for Vanuatu, Western Polynesia (Tonga and Samoa), Eastern Polynesia (the Cook Islands and French Polynesia), and the Overall Dataset, using Three Molecular Clocks and ρ as the Estimator

Molecular Clock	Region	<i>n</i>	Point estimate (years) and 95% CI ¹
Control region	Vanuatu	35	3600 (0; 7750)
	Western Polynesia	73	2950 (1000; 4900)
	Eastern Polynesia	41	2450 (200; 4700)
	Pooled data	149	3350 (1650; 5050)
Complete sequences	Vanuatu	12	3450 (1150; 5800)
Synonymous	Vanuatu	12	3250 (0; 6700)

¹Confidence interval

Table S9. mtDNA Lineages Found in Three or More Regions of the Voyaging Corridor

Haplogroup	HVS-I variants (less 16,000)	Frequency of mtDNA motif (%)							
		Taiwan (<i>n</i> =977)	Philippines (<i>n</i> =556)	Wallacea (<i>n</i> =925)	North coast of New Guinea (<i>n</i> =403)	Bismarck Sea (<i>n</i> =1260)	South coast of New Guinea (<i>n</i> =177)	Solomons (<i>n</i> =259)	Remote Oceania (<i>n</i> =278)
B5b	111 140 189 234 243 399	0.00	1.44	0.00	0.25	0.00	0.56	0.00	0.72
E1b	223 261 362 390	0.00	1.26	3.13	0.50	5.56	2.82	0.00	0.36
M7b1	126 129 192 223 297	0.61	0.90	0.22	0.99	0.08	0.00	0.00	0.00
M28	86 129 148 223 362 (468)	0.00	0.00	0.00	0.50	17.86	0.00	1.16	3.96
P1	176 266 357	0.00	0.00	0.43	1.99	3.02	5.08	0.00	1.80
P1	176 266 270 357	0.00	0.00	0.43	0.99	0.87	4.52	0.00	3.96
P1	176 357	0.00	0.00	0.65	0.50	0.08	6.78	0.00	3.60
P1	176 209 266 357	0.00	0.00	0.00	0.25	1.03	0.00	0.00	0.36
Q1	129 144 148 223 241 265C 311 343	0.00	0.00	1.41	17.12	0.87	12.99	0.77	0.00
Q1	129 144 148 222 241 265C 311 343	0.00	0.00	0.76	7.20	0.24	3.39	0.00	9.35
Q1	129 144 148 241 265C 311 343	0.00	0.00	1.84	6.45	6.03	5.08	4.63	5.76
Q1	129 144 148 172 223 241 265C 311 343	0.00	0.00	1.95	0.25	0.40	2.26	0.00	0.00
Q1	129 144 148 223 241 261 265C 311 343	0.00	0.00	0.00	2.98	0.24	2.82	0.00	0.00
Q1	129 144 148 223 241 264 265C 311 343	0.00	0.00	0.00	0.50	4.30	0.00	3.09	0.00
Q2	66 129 223 241	0.00	0.00	0.76	0.50	7.70	0.00	2.70	0.36

Supplemental References

1. Kong, Q.-P., Yao, Y.-G., Sun, C., Bandelt, H.-J., Zhu, C.-L., Zhang, Y.-P. (2003) Phylogeny of East Asian mitochondrial DNA lineages inferred from complete sequences. *Am. J. Hum. Genet.* 73:671-676 (erratum 675:157)
2. Macaulay, V., Hill, C., Achilli, A., Rengo, C., Clarke, D., Meehan, W., Blackburn, J., Semino, O., Scozzari, R., Cruciani, F. et al. (2005) Single, rapid coastal settlement of Asia revealed by analysis of complete mitochondrial genomes. *Science* 308:1034-1036
3. Kong, Q.-P., Bandelt, H.-J., Sun, C., Yao, Y.-G., Salas, A., Achilli, A., Wang, C.-Y., Zhong, L., Zhu, C.-L., Wu, S.-F. et al. (2006) Updating the East Asian mtDNA phylogeny: a prerequisite for the identification of pathogenic mutations. *Human Mol. Genet.* 15:2076-2086
4. Tanaka, M., Cabrera, V.M., González, A.M., Larruga, J.M., Takeyasu, T., Fuku, N., Guo, L.-J., Hirose, R., Fujita, Y., Kurata, M. et al. (2004) Mitochondrial genome variation in Eastern Asia and the peopling of Japan. *Genome Res.* 14:1832-1850
5. Starikovskaya, Y.B., Sukernik, R.I., Derbeneva, O.A., Volodko, N.V., Torroni, A., Ruiz-Pesini, E., Brown, M.D., Lott, M.T., Hosseini, S.H., Huoponen, K. et al. (2005) Mitochondrial DNA diversity in indigenous populations of the southern extent of Siberia, and the origins of Native American haplogroups. *Am. J. Hum. Genet.* 69:67-89
6. Mishmar, D., Ruiz-Pesini, E., Golik, P., Macaulay, V., Clark, A.G., Hosseini, S., Brandon, M., Easley, K., Chen, E., Brown, M.D. et al. (2003) Natural selection shaped regional mtDNA variation in humans. *Proc. Natl Acad. Sci. USA* 100:171-176
7. Ingman, M., Kaessmann, H., Pääbo, S., Gyllensten, U. (2000) Mitochondrial genome variation and the origin of modern humans. *Nature* 408:708-713
8. Ingman, M., Gyllensten, U. (2003) Mitochondrial genome variation and evolutionary history of Australian and New Guinean aborigines. *Genome Res.* 13:1600-1606
9. Trejaut, J.A., Kivisild, T., Loo, J.H., Lee, C.L., He, C.L., Xi, J.R., Li, Z.Y., Lin, M. (2005) Traces of archaic mitochondrial lineages persist in Austronesian speaking Formosan populations. Unambiguous linkage between Aboriginal Taiwanese and Polynesians to the exclusion of Mainland Asians. *PLoS Biol.* 3:e247
10. Tabbada, K.A., Trejaut, J., Loo, J.H., Chen, Y.M., Lin, M., Mirazón-Lahr, M., Kivisild, T., De Ungria, M.C. (2010) Philippine mitochondrial DNA diversity: a populated viaduct between Taiwan and Indonesia? *Mol. Biol. Evol.* 27:21-31
11. Pierson, M.J., Martinez-Arias, R., Holland, B.R., Gemmell, N.J., Hurles, M.E., Penny, D. (2006) Deciphering past human population movements in Oceania: provably optimal trees of 127 mtDNA genomes. *Mol Biol. Evol.* 23:1966-1975