FOR THE RECORD

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Population Genetics of 12 STR Loci in a Sample of Mestizos from Ecuador (South America)

POPULATIONS: Mestizos from Ecuador (*n* = 400)

KEYWORDS: forensic science, DNA typing, short tandem repeat, PCR, population genetics, Mestizo, Ecuador, HUMCSF1PO, HUMTPOX, HUMTH01, HUMF13A01, HUMvWA, D13S317, D16S539, D5S818, D7S820, HUMLPL, HUMF13B, HUMHPRTB

Ecuador is a small South American country with almost 12 million inhabitants comprised of three main ethnic groups: (a) Urban populations, usually dihybrid Mestizos- or trihybrid and (b) Amerindian natives, more than 100 multiethnic and pluricultural groups, and (c) African-derived populations in fairly isolated communities and descendants of slaves (1,2). Mestizos are the most representative and largest group in our country. They are descendants of Spanish (Caucasian) and Amerindian people. This is a new hybrid group, like the Mulatos who arose from Caucasians and Blacks or Zambos, a mixture of Amerindians and Blacks. We think that different degrees of genetic admixture exist, mainly with Amerindians, too. This situation has several variations towards the cities of the Andes and the cities of the Pacific coast.

Whole blood was obtained in EDTA by venipuncture from healthy unrelated Mestizos born and living in Ecuador. The DNA was extracted using the Wizard Genomic DNA Purification Kit System© (Promega Corporation, Madison WI). The multiplex analysis of HUMCSF1PO, HUMTPOX, HUMTH01, D13S317, D16S539, D5S818 and D7S820 was performed using multiplex kits from Promega Corporation (Madison, WI) and following the manufacturer's recommendations. Microsatellites HUMF13A01, HUMvWA HUMLPL, HUMF13B, and HUMHPRTB were analyzed in an uniplex approach. The recommendations from the DNA Commission of the International Society of Forensic Genetics for analysis of STRs systems were followed. Fragment size and allele designation of different loci was determined by comparison with allelic ladders distributed in the kit (Promega Corporation, Madison, WI). Evaluation of Hardy-Weinberg expectations and determination of further statistical parameters of forensic interest was carried out by using the computer program, HWE-analysis version 3.3 (Christoph Puers, Institute for Legal Medicine, University of Münster), as previously described (3,4). Minimum allele frequencies were also calculated.

References

1. Sanchez D. Molecular genetics in paternity tests. In: Paz y Miño C, Leone P, editors. Proceedings of 1st National Symposium of Human Genetics. PUCE, Quito-Ecuador, 1997;78–9.
2. Sans M. Admixture studies in Latin America: from the 20th century to the 21st century. Human Biol 2000;72(1):155–77.
3. Nievas P, Martínez-Jarreta B, Abecia E, Budowle B. Genetic analysis of the STR loci D16S539, D7S820, D13S317, D18S535, D1S1656 and loci D12S391 in two Spanish populations. In: Sensabaugh G, Lincoln P, Olaisen B, editors. Advances in forensic genetics 8. Elsiever, Amsterdam 2000;190–2.
4. Martínez-Jarreta B, Diaz Roche P, Abecia E. Genetic variation at six STR loci (CTT, FFV) in Aragon (North Spain). Forensic Sci Int 1999; 100(1):87–92.

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TABLE 1—*Allele frequency distribution. HW equilibrium tests and parameters of forensic efficiency on the loci analyzed.*

Allele	CSF1PO	TPOX	TH01	F13A01	VWA	D13S317	D16S539	D5S818	D7S820	LPL	HPRTB	HUMF13B
n =	400	400	410	336	400	389	389	389	393	320	121	216
3.2			0.001	0.011								
4			0.002	0.224								
5			0.339	0.193								
6		0.001	0.330	0.170								0.058
7	0.004	0.003	0.066	0.241			0.001	0.110	0.005	0.002	0.012	0.037
8	0.003	0.523	0.107	0.026		0.082	0.027	0.023	0.070	0.005	0.004	0.178
9	0.021	0.046	0.072	0.003		0.213	0.198	0.092	0.080	0.036	0.025	0.280
9.3			0.075									
10	0.270	0.031	0.001	0.002		0.107	0.208	0.052	0.247	0.544	0.033	0.424
11	0.308	0.271	0.002	0.009		0.149	0.213	0.433	0.296	0.202	0.107	0.021
12	0.291	0.120		0.002		0.221	0.267	0.193	0.251	0.1910	0.264	0.002
13	0.940	0.004		0.006	0.003	0.134	0.075	0.095	0.041	0.013	0.236	
14	0.100			0.0014	0.028	0.093	0.010	0.043	0.090	0.009	0.202	
15					0.065	0.001			0.001		0.099	
16					0.398						0.017	
17					0.308							
18					0.146							
19					0.040							
20					0.014							
P min	0.0075	0.0075	0.0081	0.0021	0.0075	0.0037	0.0037	0.0046	0.0038	0.0093	0.0244	0.0137
× 2	0.2200	0.6560	0.0200	0.7200	0.9370	0.1302	0.5726	0.6142	0.9510	0.2400	0.2000	0.1960
G test	0.5000	0.1120	0.2000	0.6000	0.9504	0.2238	0.4414	0.7178	0.9242	0.9400	0.6000	0.2000
Exact Test	0.4800	0.4220	0.6000	0.4000	0.8980	0.2110	0.4688	0.5768	0.9222	0.3200	0.1800	0.8000
Obs H	0.7575	0.5825	0.7568	0.8223	0.7250	0.8509	0.8046	0.7370	0.7557	0.6688	0.7851	0.8333
Exp H	0.7393	0.6367	0.7510	0.8133	0.7202	0.8399	0.7951	0.7440	0.7763	0.6268	0.8134	0.7068
MEC	0.4966	0.3883	0.5328	0.6253	0.4872	0.6760	0.5915	0.5423	0.5446	0.3814	0.6267	0.4644
MEP	0.4916	0.3372	0.5115	0.6239	0.4602	0.6750	0.5899	0.4996	0.5558	0.3243	0.6242	0.4388
PIC	0.6914	0.5835	0.7129	0.7850	0.6749	0.8183	0.7623	0.7135	0.7403	0.5762	0.7839	0.6576
PM	0.1237	0.1842	0.1012	0.6748	0.1296	0.0496	0.0755	0.0961	0.0831	0.1984	0.7739	0.1636
PD	0.8763	0.8152	0.8988	0.9325	0.8707	0.9504	0.9245	0.9039	0.9169	0.8016	0.9226	0.8364