



Criminalistics Section – 2005

B101 Mexican (Chihuahua) Population Data for the 15 STRs Loci Included in the Identifiler Kit

Luis J. Martinez-Gonzalez, MS, Laboratory of Genetic Identification, Department of Legal Medicine, University of Granada, Granada, GR 18012, Spain; M. Moguel, MS, State of Chihuahua DNA Laboratory, D.G. Servicios Periciales, Chihuahua, Mexico; E. Martinez-Espin, MS, Laboratory of Genetic Identification, Department of Legal Medicine, University of Granada, Granada, 18012, Spain; C. Entrala, PhD, J.C. Alvarez, MS, and F. Fernandez-Rosado, DDS, Laboratory of Genetic Identification, Department of Legal Medicine, University of Granada, Granada, 18012, Spain; José A. Lorente, MD, PhD*, University of Granada, Department of Legal Medicine, Av. Madrid, 12, Granada, 18012, Spain; Miguel Lorente, PhD, and E. Villanueva, MD, Laboratory of Genetic Identification, Department of Legal Medicine, University of Granada, Granada, 18012, Spain; and Bruce Budowle, PhD, FBI, FBI Academy, Quantico, VA 22135

The goal of this presentation is to present the results and parameters of forensic interest (HWE, PD, PE) of the Mexican population for the 15 STR loci included in the Applied Biosystems Identifiler kit.

This presentation will impact the forensic community and/or humanity by demonstrating data of great interest for the forensic community, since they are necessary to perform statistical calculations, both in the paternity and forensics fields, after DNA identification analysis.

The 16 STR loci D3S1358, TH01, D21S11, D18S51, D5S818, D13S317, D7S820, D16S539, CSF1PO, vWA, D8S1179, D2S1338, D19S433, TPOX & FGA, and the locus amelogenin can be amplified simultaneously using the Identifiler kit (Applied Biosystems, Foster City, CA, USA).

This paper presents allele distribution data in the Mexican population of the State of Chihuahua, Northern-Central part of the country. Whole blood was obtained from 161 unrelated volunteers and spotted on FTA paper (Whatman, USA); all individuals were actual residents along the state of Chihuahua, Mexico. Extracted DNA samples were amplified at the 16 loci using the Identifiler kit. Samples were analyzed using the ABI Prism™ 310 Genetic Analyzer (PE Biosystems, Foster City, CA) according to the manufacturer's recommended protocol.

All 15 loci are highly polymorphic in the Mexican sample population with the locus TPOX (55.3%) having the lowest observed heterozygosity, and the locus D2S1338 (88.8%) displaying the highest heterozygosity. The most discriminating loci were D18S51 (PD=0.969) and FGA (PD=0.968). The combined probability of exclusion for the 15 STR loci is 0.99999926. There was little evidence for departures from HardyWeinberg expectations (HWE) in this sample population. Based on the exact test, the loci that departed significantly from HWE were D31358 and D13S317. After employing the Bonferroni correction for the number of loci analyzed, these observations are not likely to be significant. An inter-class correlation test analysis was performed to detect any correlations between alleles at any of the pair-wise comparisons of the 15 loci. A resume of the PD and PE are shown in the following table:

Locus	PD (Obs)	PD (Exp)	PE
1 D8S1179	0.92805062	0.92517508	0.59304848
2 D21S11	0.94649126	0.95136413	0.66976540
3 D7S820	0.91709425	0.91988693	0.57759331
4 CSF1PO	0.85112457	0.86167114	0.45289261
5 D3S1358	0.91007291	0.91709457	0.57058241
6 TH01	0.90675514	0.91223821	0.55668406
7 D13S317	0.93368311	0.94236962	0.64004831
8 D16S539	0.92789630	0.93190281	0.60855433
9 D2S1338	0.95675321	0.96159279	0.70663845
10 D19S433	0.92889935	0.94148490	0.63921864
11 vWA	0.90289726	0.91729619	0.57252133
12 TPOX	0.79086455	0.79308289	0.36674141
13 D18S51	0.96909841	0.97232966	0.75147290
14 D5S818	0.85405656	0.88179848	0.49866824
15 FGA	0.96801821	0.97219246	0.75055161
Total	>0.99999999	>0.99999999	0.99999926

In conclusion, a Mexican – Chihuahua database has been established for the loci D3S1358, TH01, D21S11, D18S51, D5S818, D13S317, D7S820, D16S539, CSF1PO, vWA, D8S1179, D2S1338, D19S433, TPOX & FGA. All loci are highly polymorphic. The application of the product rule is valid for estimating the rarity of a multiple loci profile for these 15 loci.

STR, Identifiler®, Mexico