STR data for 15 AmpFLSTR Identifiler loci in a Tibetan population (Nepal)

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Abstract. Allele frequency data for 15 short tandem repeat (STR) loci, D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818 and FGA, were determined in Tibetan individuals using the AmpFLSTR Identifiler Kit. The agreement with Hardy-Weinberg expectation was confirmed for all studied loci with the exception of FGA. © 2005 Elsevier B.V. All rights reserved.

1. Introduction

In our previous studies, allele frequency data for 15 short tandem repeat (STR) loci, D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818 and FGA, were determined in three Asian populations (Japanese [1], Bangladeshis [2] and Indonesians [2]) using the AmpFLSTR Identifiler Kit. In this study we analyzed the allele frequency distributions and statistical parameters of the 15 STR loci in Tibetan individuals in Nepal.

2. Materials and methods

DNA was extracted from serum samples, which were stored at $-20\ ^{\circ}$C for 6 years, in 122 Tibetan individuals living in Katmandu (capital of Nepal) by QIAamp DNA Mini Kit

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(Qiagen). PCR amplification of the 15 STR loci was performed using the AmpFLSTR Identifiler Kit (Applied Biosystems). Possible divergence from Hardy-Weinberg equilibrium was determined using the exact test. Some statistical parameters of forensic interest such as heterozygosity (Hz), power of discrimination (PD), mean exclusion chance (MEC) and polymorphic information content (PIC) were calculated using the software package PowerStats (Promega).

3. Results and discussion

Allele frequencies and statistical parameters for the 15 STR loci in Tibetans are shown in Table 1. Differences in sample count within the data are due to failed typing. The failures were remarkable in the STR loci with the long fragment. This phenomenon may be attributed to the use of serum samples stored at $-20\ ^\circ$C for 6 years. Amelogenin included in this kit was detected in all the samples. The agreement with Hardy-Weinberg expectation was confirmed for all studied loci with the exception of FGA. It appears that this departure is caused by the small number of samples. Among the 15 STR loci, FGA showed the highest PD and the highest MEC. The combined PD and the combined MEC for the 15 STR loci were 0.999999999999999902 and 0.9999988, respectively. Allele frequency distributions of the 15 STR loci in Tibetans were compared with those in other Asian populations (Japanese [1], Bangladeshis [2] and Indonesians [2]). The allele frequencies in Tibetans were significantly different from the 11 loci except for D7S820, CSF1PO, vWA and D18S51 in Japanese, the 10 loci except for CSF1PO, D16S539, D19S433, vWA and D5S818 in Bangladeshis as well as the 10 loci except for D21S11, CSF1PO, D16S539, vWA and TPOX in Indonesians.

Table 1
Allele frequencies and statistical parameters for the 15 STR loci in Tibetans

Allele	TH01 (n=86)	TPOX (n=70)	D5S818 (n=77)	D7S820 (n=51)	CSF1PO (n=52)	D13S317 (n=86)	D16S539 (n=61)	D8S1179 (n=97)
6	0.0899	0.0143						
7	0.2640		0.0130					
8	0.1292	0.5357		0.1863		0.2093	0.0164	
9	0.4494	0.1643	0.0584	0.0980	0.0288	0.1047	0.2213	
9.3	0.0674							
10		0.0071	0.0909	0.1569	0.2122	0.2267	0.1557	0.0073
11		0.2500	0.3831	0.1961	0.1923	0.2326	0.2213	0.0206
12		0.0286	0.2468	0.3235	0.4327	0.1977	0.2541	0.1753
13			0.2013	0.0392	0.1250	0.0291	0.1148	0.1856
14			0.0065				0.0164	0.2113
15								0.1701
16								0.1443
17								0.0155
P	0.3920	0.3480	0.1390	0.0523	0.2687	0.0907	0.1013	0.0420
Hz	0.6347	0.6225	0.7492	0.7862	0.6762	0.8051	0.8030	0.8305
PD	0.8218	0.8018	0.8921	0.9221	0.8442	0.9325	0.9314	0.9481
MEC	0.4003	0.3688	0.5237	0.5817	0.4258	0.6090	0.6060	0.6576
PIC	0.5900	0.5668	0.7092	0.7540	0.6252	0.7756	0.7732	0.8073

Table 1 (*continued*)

Allele	D19S433 (*n* = 100)	D18S51 (*n* = 56)	D3S1358 (*n* = 109)	vWA (*n* = 92)	D2S1338 (*n* = 60)	FGA (*n* = 51)	D21S11 (*n* = 67)
12	0.0450	0.0179					
13	0.2850	0.3125	0.0550				
13.2	0.0850						
14	0.2150	0.1875	0.0550	0.2120			
14.2	0.1050						
15	0.0900	0.1429	0.2844	0.0272			
15.2	0.1200						
16	0.0150	0.1339	0.3807	0.2174			
16.2	0.0350						
17	0.0050	0.0714	0.1651	0.2663	0.0250		
18		0.0268	0.0459	0.1902	0.1083	0.0392	
19		0.0804	0.0138	0.0815	0.1500	0.0882	
20		0.0268		0.0054	0.1583	0.0196	
21					0.0583	0.0784	
22					0.0583	0.1078	
22.2						0.0196	
23					0.3333	0.1863	
23.2						0.0588	
24					0.0667	0.2059	
25					0.0250	0.1078	
25.2						0.0196	
26						0.0392	
27					0.0167	0.0294	
28							0.0075
28.2							0.0075
29							0.1791
30							0.2164
30.2							0.0448
31							0.1194
31.2							0.1119
32							0.0299
32.2							0.1866
33.2							0.0970
P	0.2207	0.0453	0.2983	0.0600	0.0710	0.0283	0.1107
Hz	0.8047	0.7875	0.7113	0.7805	0.8009	0.8809	0.8378
PD	0.9369	0.9334	0.8712	0.9159	0.9371	0.9745	0.9532
MEC	0.6257	0.6129	0.4777	0.5651	0.6242	0.7609	0.6748
PIC	0.7798	0.7661	0.6658	0.7446	0.7777	0.8696	0.8173

P: Hardy-Weinberg equilibrium; exact test based on 3000 shufflings.

References

[1] M. Hara, et al., Population data of 15 STR loci, D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818 and FGA, in Japanese, 8th Indo-Pacific Congress on Legal Medicine and Forensic Sciences, Abstracts, 2004, p. 61.
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