Forensic Science International: Genetics 7 (2013) e31–e34

Contents lists available at SciVerse ScienceDirect

Forensic Science International: Genetics

journal homepage: www.elsevier.com/locate/fsig

Letter to the Editor

Genetic polymorphism of 15 STR loci in Chinese Han population from Shanghai municipality in East China

Dear Editor,

A total of 186 samples from anonymous blood donors resident in Shanghai were collected according to the principles outlined in the 'Helsinki Declaration'. Shanghai is one of the four province-level municipalities of China, and it is the largest city by population of the People's Republic of China. According to census data, 98.8% of Shanghai's residents are of the Han Chinese ethnicity, while 1.2% belong to various minority groups. The laboratory has participated in proficiency testing of the GHEP-ISFG Working Group (Spanish and Portuguese Speaking Working Group of the International Society for Forensic Genetics).

Genomic DNA was extracted from bloodstains using standard phenol–chloroform methodology with proteinase K [1]. DNA concentration was determined using a spectrophotometer (NanoDrop® ND-1000).

Amplification of 15 tetranucleotide repeat loci and the Amelogenin gender-determining marker in a single PCR amplification were performed using AmpFlSTR® Identifiler® PCR Amplification Kit (Applied Biosystems) according to the user's manual recommendations. Separation of PCR products was carried out by capillary electrophoresis on an ABI3730 DNA Analyzer (Applied Biosystems). Allele designations were determined by comparison with allelic ladder and positive control provided with the kit, using the GeneMapper software 4.0.

Gene frequencies, Hardy–Weinberg equilibrium test (100,000 steps in Markov chain with 1000 of dememorization steps) and the expected and observed heterozygosity were calculated with Arlequin 3.11 [2]. After Bonferroni's correction, the original 0.05 significance threshold was reduced to a 0.0033 value for the Hardy–Weinberg equilibrium test [3]. Forensic statistic

Fig. 1. A map of China showing location of studied Chinese Han population living in Shanghai (star) and other 10 populations used for comparative study (circles).

1872-4973/$ – see front matter
http://dx.doi.org/10.1016/j.fsigen.2012.10.006

parameters-observed heterozygosity (Ho), expected heterozygosity (He), power of discrimination (PD), matching probability (PM), power of exclusion (PE), polymorphism information content (PIC)-were computed using PowerStats version 1.2 [4]. POPTREE2 program [5] was used to construct a phylogenetic tree using Fst distances with 1000 bootstrap replications and neighbor joining method [6]. The output of POPTREE was visualized with program TREEVIEW version 1.6.6 [7]. Available published populations included in the present study were: Xinjiang Uygur [8], Guangxi (Miao, Yi and Hui) [9], Yunnan [10], Shaanxi [11], Qinghai and Chongqing [12], Zhejiang [13], Shandong [14], Chongming island [15], and Hunan [16]. A map showing location of Shanghai population, south-eastern China and other populations in China is indicated in Fig. 1.

Allelic frequencies of 15 STR and parameters of forensic interest are shown in Table 1. In Hardy–Weinberg equilibrium exact test, a single P value was found below 0.05 in D13S317 locus ($P = 0.01462$). However, after applying the Bonferroni's correction ($P < 0.0033$) this value is not significant. Nevertheless, this low P value was not found together with a higher

Table 1
Allelic frequencies and statistical parameters regarding the 15 STR loci of Chinese population living in Shanghai. Ho: observed heterozygosity, He: expected heterozygosity, PD: power of discrimination, PE: power of exclusión, PIC: polymorphism information content, PM: matching probability, and p: probability values of Hardy–Weinberg equilibrium test.

Alleles	D8S1179	D21S11	D7S820	CSF1PO	D19S433	vWA	TPOX	D18S51	D5S818	FGA	D3S1358	TH01	D13S317	D16S539	D2S1338
6	–	–	–	–	–	–	–	–	–	–	–	0.0995	–	–	–
7	–	–	–	–	–	–	–	–	0.0242	–	–	0.2419	0.0027	–	–
8	–	–	0.1559	0.0054	–	–	0.5403	–	0.0027	–	–	0.0430	0.2769	0.0134	–
8.3	–	–	–	–	–	–	–	–	–	–	–	0.0032	–	–	–
9	–	–	0.0403	0.0430	–	–	0.1237	–	0.0484	–	–	0.5511	0.1505	0.2554	0.0027
9.3	–	–	–	–	–	–	–	–	–	–	–	0.0349	–	–	–
10	0.1210	–	0.1613	0.2285	–	–	0.0323	–	0.1935	–	–	0.0296	0.1478	0.1371	–
11	0.0887	–	0.3360	0.2608	0.0027	–	0.2688	0.0027	0.3199	–	–	–	0.2177	0.2634	–
11.2	–	–	–	–	0.0027	–	–	–	–	–	–	–	–	–	–
12	0.1048	–	0.2742	0.3656	0.0403	–	0.0349	0.0323	0.2312	–	–	–	0.1505	0.1962	–
12.2	–	–	–	–	0.0081	–	–	–	–	–	–	–	–	–	–
13	0.2419	–	0.0296	0.0753	0.3145	0.0027	–	0.2043	0.1720	–	–	–	0.0484	0.1102	–
13.2	–	–	–	–	0.0484	–	–	–	–	–	–	–	–	–	–
14	0.1182	–	–	0.0188	0.2177	0.2231	–	0.1882	0.0054	–	0.0699	–	0.0054	0.0242	–
14.2	–	–	–	–	0.0860	–	–	–	–	–	–	–	–	–	–
15	0.1774	–	0.0027	0.0027	0.0726	0.0484	–	0.1667	0.0027	–	0.3091	–	–	–	–
15.2	–	–	–	–	0.1774	–	–	–	–	–	–	–	–	–	–
16	0.0699	–	–	–	0.0027	0.1613	–	0.1478	–	–	0.3253	–	–	–	0.0108
16.2	–	–	–	–	0.0269	–	–	–	–	–	–	–	–	–	–
17	0.0081	–	–	–	–	0.2312	–	0.0726	–	–	0.2177	–	–	–	0.0806
18	–	–	–	–	–	0.1855	–	0.0349	–	0.0296	0.0726	–	–	–	0.1075
19	–	–	–	–	–	0.1371	–	0.0591	–	0.0672	0.0054	–	–	–	0.1828
20	–	–	–	–	–	0.0108	–	0.0403	–	0.0403	–	–	–	–	0.1263
21	–	–	–	–	–	–	–	0.0188	–	0.1102	–	–	–	–	0.0323
21.2	–	–	–	–	–	–	–	–	–	0.0027	–	–	–	–	–
22	–	–	–	–	–	–	–	0.0215	–	0.1989	–	–	–	–	0.0323
22.2	–	–	–	–	–	–	–	–	–	0.0081	–	–	–	–	–
23	–	–	–	–	–	–	–	0.0108	–	0.1989	–	–	–	–	0.1882
23.2	–	–	–	–	–	–	–	–	–	0.0027	–	–	–	–	–
24	–	–	–	–	–	–	–	–	–	0.1935	–	–	–	–	0.1559
24.2	–	–	–	–	–	–	–	–	–	0.0054	–	–	–	–	–
24.4	–	–	–	–	–	–	–	–	–	0.0027	–	–	–	–	–
25	–	–	–	–	–	–	–	–	–	0.0618	–	–	–	–	0.0726
25.2	–	–	–	–	–	–	–	–	–	0.0054	–	–	–	–	–
26	–	–	–	–	–	–	–	–	–	0.0618	–	–	–	–	0.0081
26.2	–	–	–		–	–	–	–	–	0.0081	–	–	–	–	–
27	–	0.0054	–	–	–	–	–	–	–	–	–	–	–	–	–
28	–	0.0323	–	–		–	–	–	–	0.0027	–	–	–	–	–
28.2	–	0.0027	–	–	–	–	–	–	–	–	–	–		–	–
29	–	0.2688	–	–	–	–	–	–	–	–	–	–	–	–	–
30	–	0.3522	–	–	–	–	–	–	–	–	–	–	–	–	–
30.2	–	0.0054	–	–	–	–	–	–	–	–	–	–	–	–	–
30.3	–	0.0108	–	–	–	–	–	–	–	–	–	–	–	–	–
31	–	0.0860	–	–	–	–	–	–	–	–	–	–	–	–	–
31.2	–	0.0618	–	–	–	–	–	–	–	–	–	–	–	–	–
32	–	0.0161	–	–	–	–	–	–	–	–	–	–	–	–	–
32.2	–	0.1048	–	–	–	–	–	–	–	–	–	–	–	–	–
33	–	0.0081	–	–	–	–	–	–	–	–	–	–	–	–	–
33.2	–	0.0323	–	–	–	–	–	–	–	–	–	–	–	–	–
34	–	0.0027	–	–	–	–	–	–	–	–	–	–	–	–	–
34.2	–	0.0108	–	–	–	–	–	–	–	–	–	–	–	–	–
H_o	0.83871	0.80108	0.81183	0.72043	0.82796	0.84409	0.65591	0.84946	0.7957	0.85484	0.76882	0.56989	0.7957	0.80645	0.85484
H_e	0.83839	0.7809	0.76112	0.74023	0.80692	0.81729	0.6199	0.86194	0.77628	0.85868	0.74304	0.62563	0.80854	0.79731	0.86763
PD	0.933	0.917	0.898	0.885	0.932	0.933	0.787	0.959	0.913	0.963	0.881	0.817	0.928	0.925	0.965
PE	0.636	0.601	0.621	0.461	0.652	0.683	0.363	0.694	0.591	0.704	0.543	0.262	0.591	0.611	0.704
PIC	0.790	0.750	0.720	0.690	0.780	0.790	0.560	0.840	0.740	0.840	0.700	0.580	0.780	0.760	0.850
PM	0.067	0.083	0.102	0.115	0.068	0.067	0.213	0.041	0.087	0.037	0.119	0.183	0.072	0.075	0.035
p	0.08279	0.20059	0.97281	0.07899	0.29705	0.3256	0.60494	0.24148	0.64205	0.96586	0.08738	0.06486	0.01462	0.99263	0.8504