

FOR THE RECORD

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Population Genetics of Eleven STR Loci in the State of Sergipe, Northeastern Brazil

POPULATION: Over 259 unrelated individuals from the State of Sergipe (Northeastern Brazil)

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STR loci have been routinely used for personal identification in forensic cases and parentage study, becoming the predominant genetic markers in this field. In order to use these markers in a safe and efficient manner, it is necessary to establish their allelic distribution in the different populations where their study is applied (1,2). There is still a lack of information about these markers in the Northeast of Brazil, a region characterized by an intense ethnic admixture. The aim of this work was to determine the allelic frequencies of the 11 STR loci D16S539, D7S820, D13S317, D3S1358,

CSF1PO, TPOX, TH01, F13A01, LPL, F13B and vWA in the State of Sergipe—Northeastern Brazil, as well as other statistic parameters for human identification purposes. Peripheral blood was collected from at least 259 unrelated individuals and DNA was extracted through Chelex method (3). Amplification of the DNA was carried out and the products were analyzed by denaturing polyacrylamide gel silver stained. Computer programs—Power Stats V12.xls (4) and Arlequin 2.0 softwares (5)—performed the statistic analysis. The allele frequencies for all the loci are shown in Table 1. Some statistic parameters for human identification purposes are described in Table 2. The combined matching probability of all loci was $2,5 \times 10^{-12}$, corresponding to a value expressed as 1 in 400 billions individuals. Power of exclusion combining all the loci had a value of 0,9998, demonstrating a high discrimination of these eleven markers in paternity testing in this population. The exact test

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TABLE 1—Allele frequencies of the 11 STR loci studied in the population of the State of Sergipe, Northeastern Brazil.

Alleles	D16S539 (n = 752)	D7S820 (n = 750)	D13S317 (n = 752)	D3S1358 (n = 698)	CSF1PO (n = 752)	TPOX (n = 752)	TH01 (n = 750)	F13A01 (n = 522)	VWA (n = 652)	F13B (n = 518)	LPL (n = 546)
3,2	...	...	...	...	...	...	...	0,105	...	...	...
4	...	...	...	...	...	...	...	0,061	...	...	...
5	0,001	0,001	...	...	...	...	0,001	0,257	...	...	...
6	...	...	...	...	...	0,009	0,191	0,188	...	...	...
7	...	0,020	...	...	0,021	0,004	0,223	0,303	...	0,193	0,002
8	0,024	0,151	0,106	...	0,015	0,448	0,143	0,021	...	0,054	0,002
9	0,173	0,125	0,063	...	0,011	0,116	0,207	...	...	0,214	0,112
9,3	...	...	...	...	...	...	0,219	...	...	...	...
10	0,089	0,285	0,031	...	0,289	0,082	0,015	...	...	0,212	0,366
11	0,303	0,231	0,288	...	0,274	0,299	0,003	0,002	0,002	0,321	0,229
12	0,239	0,143	0,307	0,001	0,337	0,041	...	0,002	0,002	0,006	0,243
13	0,144	0,040	0,130	0,003	0,046	...	...	0,015	0,003	...	0,046
14	0,027	0,004	0,074	0,113	0,007	...	...	0,019	0,089	...	...
15	...	...	0,001	0,276	...	...	...	0,023	0,147	...	...
15,2	...	...	...	0,001	...	...	...	...	...	...	...
16	...	...	...	0,256	...	...	...	0,002	0,250	...	...
17	...	...	...	0,208	...	...	...	0,002	0,271	...	...
18	...	...	...	0,135	...	...	...	...	0,159	...	...
19	...	...	...	0,006	...	...	...	...	0,071	...	...
20	...	...	...	...	...	...	...	...	0,006	...	...

n = number of alleles.

TABLE 2—Forensic and paternity statistic parameters for the eleven STR loci studied in Sergipe, Brazil.

	PD	PIC	PE	TPI	OH	EH	MP		HWE (<i>p</i>)
							Value	Expressed as 1 in	
D16S539	0,924	0,76	0,600	2,51	0,801	0,792	0,076	13,2	0,84238
D7S820	0,934	0,78	0,589	2,44	0,795	0,806	0,066	15,2	0,97502
D13S317	0,919	0,75	0,615	2,61	0,809	0,786	0,081	12,3	0,93777
D3S1358	0,918	0,75	0,546	2,18	0,771	0,785	0,082	12,2	0,10241
CSF1PO	0,876	0,67	0,453	1,76	0,715	0,725	0,124	8,1	0,95226
TPOX	0,847	0,64	0,427	1,66	0,699	0,688	0,153	6,5	0,73329
TH01	0,929	0,77	0,575	2,34	0,787	0,804	0,071	14,1	0,06522
F13A01	0,919	0,76	0,579	2,37	0,789	0,794	0,081	12,3	0,05621
VWA	0,934	0,78	0,555	2,23	0,766	0,806	0,066	15,2	0,92824
F13B	0,908	0,73	0,476	1,85	0,730	0,774	0,092	10,8	0,25628
LPL	0,885	0,70	0,499	1,95	0,744	0,741	0,115	8,7	0,39228

PD: Power of discrimination; PIC: Polymorphism information content; PE: Power of exclusion; TPI: Typical paternity index; OH: Observed heterozygosity; EH: Expected heterozygosity; MP: Matching probability; HWE: Hardy-Weinberg equilibrium.

demonstrated that all the loci are in Hardy-Weinberg equilibrium in the population analyzed. A more complete data set can be accessed at <http://www.mhn.ufal.br/forense>.

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