Announcement of Population Data

Genetic polymorphism study on 12 X STR loci of investigator Argus X STR kit in Bhil tribal population of Madhya Pradesh, India

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ABSTRACT

The analysis of 12 X STR loci (DXS10103, DXS8378, DXS7132, DXS10134, DXS10074, DXS10101, DXS10135, DXS7423, DXS10146, DXS10079, HPRTB and DXS10148) belonging to four linkage group was done in 183 (100 males and 83 females) unrelated members of Bhil population. Heterozygosity among the studied 12 X STR loci showed a distribution of from 59.7% to 92.8%. No significant difference was recorded in the allele frequencies of males and females. The loci DXS10135 and DXS10101 were found to be most polymorphic. Haplotype diversity was found to be higher than 0.990 for all the four linkage groups. A total of 86, 69, 71 and 71 haplotypes were observed for linkage group I, II, III and IV, respectively. The results showed departure from Hardy–Weinberg equilibrium with respect to three loci DXS10079, DXS10135 and DXS10101. This is first report on these 12 X STR markers from India. All the loci in the Argus X 12 kit were fairly informative in the Bhil population and the population showed significant genetic variation with all the compared populations from other parts of the world.

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Population: Bhils are listed as tribal residents of the states of Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra and Rajasthan – all in the eastern Deccan regions and central India. Bhil, the highest populated tribe of Madhya Pradesh, speak the Bhil languages and are divided into a number of endogamous territorial divisions, which in turn have a number of clans and lineages. Most Bhils now speak a dialect of Hindi. Madhya Pradesh, the second largest state in central India, is a medley of ethnic groups and tribes, castes and communities. The State has a total of forty-six Scheduled Tribes (enumerated at 2001 census). Marriages of girls and boys below the legal age for each are in practice among the tribes of Madhya Pradesh. Hinduism is the predominant religion (91.1) of the State as many as 96.1% STs are Hindus. Bhil is the most populous tribe having a number of 4,618,068, constituting 37.7% of the total tribal population. Bhils have the highest population in Jhabua district followed by Dhar, Barwani and West Nimar districts of Madhya Pradesh. More than 60% Bhil workers are 'Cultivators' [1]. A number of 183 healthy unrelated individuals (100 males and 83 females) from Bhil tribe of Madhya Pradesh were typed using Argus X 12 kit.

Extraction: DNA was extracted from the peripheral blood samples collected from 183 individuals by using Magtration 12 GC Automated Nucleic Acid Extraction System (Precision System Science Co., Ltd., Japan) using manufacturer's instructions.

DNA quantitation: Real Time PCR ABI 7000 (Applied Biosystems, Foster City, CA, USA) was used for quantification of the isolated DNA using Quantifiler DNA Quantification Kit (Applied Biosystems, Foster City, CA, USA) as per the recommended protocol by the manufacturer.

Amplification: Multiplexed PCR amplifications of the 12 X STR Loci: DXS10103, DXS8378, DXS7132, DXS10134, DXS10074, DXS10101, DXS10135, DXS7423, DXS10146, DXS10079, HPRTB and DXS10148 were performed using the Argus X-12 PCR Amplification Kit (Qaigen) according to the manufacturers recommended protocol provided with the kit.

Typing: The amplified PCR products were run on Genetic Analyzer ABI 3100 (Applied Biosystems, Foster City, CA, USA). The analyzer was equipped with 36 cm arrays, with separation of fragments using POP-4 polymer (Applied Biosystems, Foster City, CA, USA) and the data were analysed with GeneMapper ID Analysis Software (Applied Biosystems, Foster City, CA, USA). A peak detection threshold of 50 RFUs was used for allele designation. Alleles were designated on the basis of number of allele repeats and in accordance with the guildelines of IFSH [2] by the help of allelic ladders provided by the manufacturers.

Quality control: Passed Proficiency testing of the GITAD, Spain http://gitad.ugr.es/ principal.htm) and quality control exercise of

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Table 1
Observed allele frequencies and forensic parameters for 12 X STR loci in the Bhil population.

Alleles/n	DXS10103	DXS8378	DXS7132	DXS10134	DXS10074	DXS10101	DXS10135	DXS7423	DXS10146	DXS10079	HPRTB	DXS10148
7					0.045							
8		0.004			0.045							
9		0.030			0.011						0.004	
10		0.297									0.011	
11		0.380	0.034								0.068	
12		0.241	0.071								0.233	
13		0.049	0.301					0.015			0.447	
14			0.338		0.015			0.489		0.004	0.154	
15			0.199		0.090			0.395		0.011	0.075	
16	0.342		0.038		0.192			0.086		0.015	0.008	0.004
16.2					0.004							
17	0.094		0.019		0.323			0.011		0.041		0.019
17.1							0.008					
18	0.180				0.173		0.064	0.004		0.173		0.188
19	0.297				0.075		0.034			0.259		0.068
19.1							0.004					
20	0.064				0.023		0.045			0.259		0.041
21	0.023				0.004		0.113			0.143		0.038
21.1							0.004					
22							0.075			0.083		0.004
22.1							0.004					0.023
23							0.105		0.004	0.011		0.015
23.1							0.011					0.023
24							0.064		0.019			0.011
24.1												0.083
24.2						0.004						
25							0.053		0.041			
25.1												0.113
25.2						0.019						
26						0.011	0.030		0.124			
26.1												0.180
26.2						0.008						
27						0.041	0.083		0.173			
27.1												0.102
27.2						0.034						
28						0.019	0.090		0.184			
28.1												0.071
28.2						0.060						
29						0.030	0.079		0.180			
29.1												0.011
29.2						0.113						
30				0.004		0.041	0.060		0.158			
30.1												0.008
30.2						0.064						
31				0.004		0.120	0.045		0.086			
31.2						0.079						
32				0.038		0.143	0.015		0.008			
32.2						0.060						
33				0.064		0.098	0.011					
33.2						0.011						
34				0.147		0.038	0.004					
34.2				0.004		0.004						
35				0.233		0.004						
35.3				0.041								
36				0.169								
36.2				0.004								
37				0.086								
37.2				0.004								
37.3				0.038								
38				0.090					0.004			
38.2				0.008								
38.3				0.019								
39				0.023								
39.2				0.004								
40.2									0.008			
40.3				0.004								
41.3				0.008								
42.2									0.004			
42.3				0.008								
43.2									0.004			
44												
45.2									0.004			
OH	0.749	0.706	0.747	0.870	0.810	0.917	0.928	0.597	0.854	0.806	0.711	0.888
PE	0.370	0.314	0.368	0.596	0.470	0.719	0.750	0.206	0.558	0.462	0.320	0.638