

FOR THE RECORD

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Characterization of TP53 Microsatellite Locus Among Selected Ethnic Populations of India

POPULATION: A total of 253 individuals belonging to five ethnic populations of India were analyzed for pentanucleotide microsatellite TP53. These included Konkanasthas and Marathas (from Maharashtra, western India) representing Indo-Aryan lineage and Ezhavas, Nairs and Muslims (from Kerala, southwest India) representing Indo-Dravidian lineage. To the best of our knowledge, allele frequency data at TP53 microsatellite locus exists only for German Caucasians (1,2), Northern Portuguese (3) and West African from S. Tomé e Príncipe (4); the present study is the first report on Asian populations.

KEYWORDS: forensic science, microsatellite, TP53, India, Indo-Aryan, Indo-Dravidian

Peripheral blood samples were collected from healthy, unrelated adults after informed consent. Genomic DNA was isolated using non-enzymatic method (5) and PCR amplified using fluorescently labeled locus-specific primers (1). The amplicons were analyzed on ALFTM Express DNA Sequencer (Amersham Pharmacia Biosciences Pvt. Ltd., Uppasala, Sweden). Internal ladders were used in each lane to compensate for mobility shifts.

Nomenclature of alleles was based on the number of repeat units. Allele frequencies and gene diversities were computed using Arlequin ver. 1.1 (6). Observed and expected genotype frequencies were calculated using POPGENE ver. 1.32 (7). The polymorphism information content (PIC) and the power of discrimination (PD) was estimated as by Botstein et al. (8) and Fisher (9), respectively. To detect significant departures from Hardy-Weinberg equilibrium (HWE) expectations, three tests were performed: Exact test using Arlequin ver 1.1 and conventional Chi-square analysis and Likelihood ratio test using POPGENE ver 1.32.

The two populations from western India showed five alleles each, while the three populations from southwestern India showed six alleles each. The number of observed genotypes varied from 8–11. The most common genotype was 7–8 among all the five groups. The observed heterozygosity ranged between 0.60 and 0.84. All the five populations were in Hardy-Weinberg equilibrium.

The complete dataset can be accessed via electronic mail from the authors at anugh@magnum.barc.ernet.in or msesh@apsara.barc.ernet.in.

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TABLE 1—Allele frequency distribution at TP53 locus among study populations.

Allele	Konkanasthas (<i>n</i> = 130) Frequency ± s.d.	Marathas (<i>n</i> = 106) Frequency ± s.d.	Ezhavas (<i>n</i> = 98) Frequency ± s.d.	Nairs (<i>n</i> = 86) Frequency ± s.d.	Muslims (<i>n</i> = 86) Frequency ± s.d.
4	...	...	0.02 ± 0.014 (2)	0.01 ± 0.012 (1)	...
5	...	...	0.03 ± 0.017 (3)	...	0.01 ± 0.012 (1)
6	0.01 ± 0.007 (1)	0.03 ± 0.016 (3)	0.02 ± 0.01 (2)	0.02 ± 0.016 (2)	0.02 ± 0.016 (2)
7	0.44 ± 0.044 (57)	0.38 ± 0.047 (40)	0.41 ± 0.050 (40)	0.41 ± 0.053 (35)	0.30 ± 0.050 (26)
8	0.37 ± 0.043 (48)	0.41 ± 0.048 (44)	0.40 ± 0.050 (39)	0.42 ± 0.053 (36)	0.46 ± 0.054 (40)
9	0.18 ± 0.034 (23)	0.17 ± 0.037 (18)	0.12 ± 0.033 (12)	0.12 ± 0.035 (10)	0.13 ± 0.036 (11)
10	0.01 ± 0.007 (1)	0.01 ± 0.009 (1)	...	0.02 ± 0.016 (2)	0.07 ± 0.027 (6)

n = No. of chromosomes; The number in the parenthesis denotes the observed number for each allele.

TABLE 2—Genotype frequencies at TP53 microsatellite among study populations.

Genotype	Konkanasthas (<i>N</i> = 65)			Marathas (<i>n</i> = 53)			Ezhavas (<i>N</i> = 49)			Nairs (<i>N</i> = 43)			Muslims (<i>N</i> = 43)		
	Obs No.	Exp No.	Obs Freq	Obs No.	Exp No.	Obs Freq	Obs No.	Exp No.	Obs Freq	Obs No.	Exp No.	Obs Freq	Obs No.	Exp No.	Obs Freq
4-7	...	...	...	...	...	...	1	0.82	0.020	1	0.41	0.023	...	...	...
4-8	...	...	...	...	...	...	1	0.80	0.020	...	...	...	...	...	...
5-8	...	...	...	...	...	...	3	1.21	0.061	...	...	...	1	0.47	0.023
6-7	...	...	...	1	1.14	0.019	2	0.82	0.041	...	...	...	1	0.61	0.023
6-8	...	...	...	1	1.26	0.019	...	...	...	2	0.85	0.046	...	...	...
6-9	1	0.18	0.015	1	0.51	0.019	...	...	...	...	...	...	...	...	...
6-10	...	...	...	...	...	...	...	...	...	...	...	...	1	0.14	0.023
7-7	13	12.37	0.200	8	7.43	0.151	10	8.04	0.204	3	7.00	0.070	3	3.82	0.070
7-8	21	21.21	0.323	16	16.76	0.302	15	16.1	0.306	21	14.8	0.488	12	12.2	0.279
7-9	9	10.16	0.138	6	6.86	0.113	2	4.95	0.041	5	4.11	0.116	6	3.36	0.139
7-10	1	0.44	0.015	1	0.38	0.019	...	...	...	2	0.82	0.046	1	1.83	0.023
8-8	10	8.74	0.154	9	9.00	0.170	6	7.64	0.122	4	7.41	0.093	11	9.17	0.256
8-9	7	8.56	0.108	9	7.54	0.170	8	4.82	0.163	5	4.23	0.116	3	5.17	0.070
8-10	...	...	...	...	...	...	...	...	...	...	...	...	2	2.82	0.046
9-9	3	1.96	0.046	1	1.45	0.019	1	0.68	0.020	...	...	...	...	...	...
9-10	...	...	...	...	...	...	...	...	...	...	...	...	2	0.78	0.046

N = Number of samples; Obs No. = Number observed; Exp No. = Number expected; Obs Freq = Observed frequency.

TABLE 3—Statistical analysis of TP53 microsatellite locus.

	Konkanasthas	Marathas	Ezhavas	Nairs	Muslims
Observed heterozygosity	0.60	0.66	0.65	0.84	0.67
Expected heterozygosity	0.64 ± 0.018	0.66 ± 0.021	0.66 ± 0.026	0.65 ± 0.028	0.67 ± 0.033
Polymorphic information content	0.71	0.72	0.72	0.71	0.72
Power of discrimination	0.64	0.81	0.82	0.80	0.84
Hardy Weinberg Equilibrium (<i>p</i> > 0.05)					
Exact test (<i>P</i> value)	0.564 ± 0.0015	0.941 ± 0.0007	0.29 ± 0.0011	0.125 ± 0.0010	0.290 ± 0.0015
Chi-square test (<i>P</i> value)	0.721	0.985	0.645	0.512	0.473
Likelihood ratio test (<i>P</i> value)	0.799	0.980	0.492	0.320	0.576