



A genetic population study of seven Y-chromosome STR-loci in a population of Brescia area (North Italy)

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Abstract

The object of this work was to examine a set of Y-STR systems in the population of Brescia (North Italy) to create a database. In the present study, 51 DNA samples taken from unrelated males were analysed and PCR amplification of DYS19, DYS389-I/II, DYS390, DYS391, DYS392 and DYS393 was performed. PCR products were separated by manual procedures. The frequencies of Y-STR haplotypes are presented.

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1. Introduction

Y-Chromosomal STR-loci have been extensively investigated in forensic science with applications for male identification and paternity testing [1–3].

In particular, the use of Y-chromosome STRs is recommended in deficiency cases and in the discrimination of stains when a male suspect is involved [4].

In order to apply a set of useful Y-STR systems and to create a database for the population of the Brescia area (Lombardy, North Italy), a panel of seven Y-STRs were investigated.

2. Materials and methods

Samples used in this study were obtained from a group of 51 unrelated males.

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Table 1
Characteristics of Y-chromosomal STRs

System	Primers sequence	Amplification conditions
DYS19	5'-CTACTGAGTTT0TGTATAGT-3' 5'-ATGGCATGTAGTGAGGACA-3'	94 °C 1 min/51 °C 1 min 72 °C 1 mm 30 cycles 72 °C 10 min
DYS389-I/II	5'-CCAACTCTCATCTGTATTATCTAT-3' 5'-TCTTATCTCCACCCACCAGA-3'	94 °C 1 min/52 °C 1 min 72 °C 1 mm 30 cycles 72 °C 10 min
DYS390	5'-TATATTTTACACATTTTGGGCC-3' 5'-TGACAGTAAAATGAACACAAGC-3'	94 °C 1 min/52 °C 1 min 72 °C 1 min 30 cycles 72 °C 10 min
DYS391	5'-CTATTCATTCAATCATAACCCA-3' 5'-GATTCTTTGTGGTGGGTCTG-3'	94 °C 1 min/58 °C 1 min 72 °C 1 min 30 cycles 72 °C 10 min
DYS392	5'-TCATTAATCTAGCTTTTAAACCAA-3' 5'-AGACCCAGTTGATGCAATGT-3'	94 °C 1 mm/52 °C 1 min 72 °C 1 min 25 cycles 72 °C 10 min
DYS393	5'-GTGGTCTTCTACTTGTGTCAATAC-3' 5'-AACTCAAGTCCAAAAAATGAGG-3'	94 °C 30 s/62 °C 30 s 72 °C 30 s 30 cycles 72 °C 10 min

DNA was extracted with the standard procedure by using pCIA and the samples were typed for the following loci: DYS19, DYS389-I/II, DYS390, DYS391, DYS392 and DYS393.

PCR amplification was performed in a 2400 Thermal Cycler (Perkin Elmer) using the amplification conditions outlined in Table 1. The PCR products were analysed by different manual procedures as detailed in Table 2. Products were visualized by silver staining.

3. Results and discussion

The haplotypes obtained by the analysis of seven STRs are shown in Table 3. We have identified 46 different haplotypes and 42 were present once. The commonest haplotype was shown to have a frequency of 5.9%. Three different alleles were seen for DYS389I/II, four for DYS19, DYS391, DYS392 and DYS393, and five for DYS390. No evidence of particular differences from other Italian populations was detected [5].

Table 2
Electrophoresis conditions

	8% Nondenaturing gel	4% Denaturing gel	6% Denaturing gel
Acrylamide 30%	10.8 ml		
Acrylamide 40%		4.5 ml	5.5 ml
Urea		19 g	15.7 g
TBE 5 ×	8.4 ml	4.5 ml	3.7 ml
dH ₂ O	22.8 ml	21.7 ml	20 ml
TEMED	196 µl	58 µl	58 µl
PSA	39 µl	300 µl	300 µl

Table 3
Y-STR haplotype combinations

	DYS19	DYS389 I	DYS389 II	DYS390	DYS391	DYS392	DYS393
3	13	11	27	25	11	13	13
2	14	10	26	23	10	13	13
2	15	10	26	23	9	11	12
2	15	9	25	21	10	11	13
1	12	11	27	26	10	11	13
1	13	11	26	23	11	13	13
1	13	10	25	24	10	13	13
1	13	10	26	24	10	11	13
1	13	10	26	24	11	13	13
1	13	10	26	26	10	11	13
1	13	10	25	24	11	12	13
1	13	10	26	25	11	13	12
1	13	9	26	24	11	13	13
1	13	10	26	25	10	13	13
1	14	10	25	23	10	11	13
1	14	10	26	24	11	13	14
1	14	11	27	25	10	13	13
1	14	10	25	23	11	13	13
1	14	10	26	24	11	13	12
1	14	10	26	25	11	13	13
1	14	11	26	24	11	14	13
1	14	11	27	24	10	13	12
1	14	10	27	23	11	13	12
1	14	9	27	22	10	11	13
1	14	11	27	23	12	13	13
1	14	11	27	23	10	11	12
1	14	10	28	24	10	11	13
1	14	10	26	23	10	13	13
1	14	10	26	22	10	13	13
1	14	11	26	23	11	13	12
1	14	11	26	23	10	13	13
1	14	10	25	24	11	13	13
1	14	10	27	23	10	13	13
1	14	10	25	22	10	11	13
1	14	10	26	24	10	13	13
1	14	10	26	26	10	11	13
1	15	9	26	23	11	11	13
1	15	10	26	23	10	12	15
1	15	10	27	25	11	13	13
1	15	10	26	24	9	11	12
1	15	9	26	22	10	11	14
1	15	10	26	24	11	11	13
1	16	11	26	24	11	13	13
1	16	10	27	25	10	11	13
1	16	10	26	25	11	12	13
1	16	11	27	25	10	11	13
1	17	10	26	24	11	11	13

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