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# Population data for four X-chromosomal STR loci in a population sample from Brescia (northern Italy)

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**Abstract.** To establish a database for DXS8378, DXS7132, HPRTB, DXS7423 loci in an Italian population sample from Brescia (northern Italy), 90 unrelated individuals were typed. DNA was amplified in a multiplex reaction with subsequent automatic detection using capillary electrophoresis. The obtained data are very useful in our practice and they give a contribution to the definition of Italian population STR allelic, genotypic and haplotypic frequencies for the four analysed loci.


*Keywords:* X-chromosome STRs; Frequency data; Italy

## 1. Introduction

Short tandem repeat markers on the X-chromosome are the natural counterpart to the well-established Y-chromosome STR loci and they have proven to provide useful tools in paternity cases with female offspring or in forensic identification cases based on the comparison with first- or second-degree relatives.

However, before a new locus can be introduced in the forensic current practice, a database for the relevant population must be established to evaluate its effectiveness [1]. Because of the few population data regarding X-chromosome STR loci in Italy, 90 unrelated individuals (60 females and 30 males) from Brescia region were typed for the STR loci DXS8378, DXS7132, HPRTB, DXS7423.

## 2. Materials and methods

Genomic DNA was extracted using Chelex-100 procedure from whole blood or buccal swabs. PCR was performed in a GeneAmp PCR System 2400 (PE) using the commercial

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Table 1
Females: allele frequencies

| DXS7132 | |
|---|---|
| Allele | Frequency |
| 11 | 0.0166 |
| 12 | 0.075 |
| 13 | 0.275 |
| 14 | 0.3083 |
| 15 | 0.2583 |
| 16 | 0.0583 |
| 17 | 0.0083 |

Table 2
Females: allele frequencies

| DXS7423 | |
|---|---|
| Allele | Frequency |
| 11 | 0.0083 |
| 12 | 0.0083 |
| 13 | 0.025 |
| 14 | 0.325 |
| 15 | 0.4333 |
| 16 | 0.1583 |
| 17 | 0.0416 |

kit Mentype Argus X-UL (Biotype AG, Dresden, Germany) according to manufacturer's recommendations. Typing was performed by capillary electrophoresis (ABI Prism 310 Genetic Analyzer, ABI).

Allele scoring for these loci was obtained by comparison to Mentype Allelic Ladder (Biotype AG, Dresden, Germany).

Table 3
Females: allele frequencies

| HPRTB | |
|---|---|
| Allele | Frequency |
| 9 | 0.0166 |
| 11 | 0.1333 |
| 12 | 0.4416 |
| 13 | 0.1916 |
| 14 | 0.1916 |
| 15 | 0.025 |

Table 4
Females: allele frequencies

| DXS8378 | |
|---|---|
| Allele | Frequency |
| 9 | 0.0083 |
| 10 | 0.2583 |
| 11 | 0.3166 |
| 12 | 0.3583 |
| 13 | 0.0583 |

Table 5
Males: haplotypes

| DXS8378 | HPRTB | DXS7423 | DXS7132 | No. |
|---|---|---|---|---|
| 11 | 13 | 15 | 14 | 1 |
| 10 | 13 | 15 | 14 | 1 |
| 11 | 12 | 15 | 14 | 2 |
| 11 | 12 | 15 | 13 | 1 |
| 11 | 13 | 14 | 14 | 1 |
| 11 | 12 | 16 | 14 | 2 |
| 11 | 11 | 16 | 13 | 2 |
| 12 | 14 | 15 | 12 | 1 |
| 11 | 10 | 15 | 13 | 1 |
| 12 | 13 | 16 | 15 | 1 |
| 10 | 14 | 16 | 14 | 1 |
| 11 | 11 | 15 | 13 | 1 |
| 12 | 12 | 15 | 13 | 1 |
| 12 | 12 | 14 | 15 | 1 |
| 10 | 12 | 16 | 15 | 1 |
| 10 | 11 | 15 | 13 | 1 |
| 10 | 12 | 14 | 14 | 1 |
| 12 | 13 | 14 | 14 | 1 |
| 10 | 12 | 13 | 11 | 1 |
| 11 | 12 | 15 | 16 | 1 |
| 11 | 16 | 13 | 12 | 1 |
| 10 | 12 | 16 | 14 | 1 |
| 11 | 12 | 14 | 16 | 1 |
| 11 | 12 | 14 | 15 | 1 |
| 11 | 13 | 15 | 13 | 1 |
| 12 | 12 | 13 | 15 | 1 |
| 11 | 12 | 17 | 15 | 1 |

## 3. Results and discussion

The allelic, genotypic and haplotypic frequencies for each Chr-X marker were calculated separately for females and males (Tables 1–5). For females the major PIC (power of discrimination) and DP (Discrimination Power) values were found for the DXS7132 locus (0.7115 and 0.8795, respectively).

This work provides a picture of allelic, genotypic and haplotypic frequencies for four X-chromosome STR loci from Brescia region. As expected, the preliminary results in the frequencies distribution in our population sample are close to those found in the Caucasian population [2–4].

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