



Letter to the Editor

Genetic data for D1S1677, D2S441, D4S2364, D10S1248, D14S1434 and D22S1045 miniSTR loci from the state of Rio Grande do Sul, Southern Brazil

Dear Editor

We determined the allelic frequencies for six miniSTR loci D10S1248, D14S1434, D22S1045 (miniplex NC01) and D1S1677, D2S441, D4S2364 (miniplex NC02) in a sample of 439 unrelated individuals from the Rio Grande do Sul State (RS), Southern Brazil. This paper followed the FSI Genetics guideline recommendations [1].

Blood samples were collected from 439 subjects who were representative of the seven RS geopolitical regions [2], from the ring finger tip in a FTA card. All participants signed an informed consent. DNA was purified from blood spots on Whatman FTA cards using the manufacturer's protocols. A total of 0.5–1.0 ng of DNA, contained in a 1.2 mm punch of FTA paper, were amplified following the parameters outlined in [3] for the NC01 and NC02 miniplexes. Electrophoresis of the amplified fragments was performed in an ABI PRISM® 3100-Avant Genetic Analyzer using the separation medium performance optimized polymer (POP) 4 and 47 cm capillaries (Applied Biosystems, Foster City, USA).

Allelic designation was determined using Applied Biosystems GeneMapper® ID-X Software v1.2, calibrated with standard DNA cell lines K562, 9947A, 9948 and 007 (www.cstl.nist.gov/div831/strbase/miniSTR/miniSTR_NC_loci_types.htm). Corrected allele nomenclature for six miniSTR loci NC01 and NC02 were those reported in the website <http://www.cstl.nist.gov/biotech/strbase/miniSTR.htm#NomenclatureErrata> and confirmed by Hill et al. [4] and according to recommendations of the DNA Commission of the ISFG [5]. The laboratory where this research was developed participates in the Proficiency testing of the GHEP-ISFG WG (Spanish–Portuguese Speaking Working Group of International Society for Forensic Genetics) (<http://www.GEP-isfg.org>).

Regarding data analysis, Hardy–Weinberg exact test (P), expected heterozygosity (H_e), observed heterozygosity (H_o), and polymorphic information content (PIC) were performed using the CERVUS version 3.0.3 [6]. Matching probability (MP), power of discrimination (PD), power of exclusion (PE), and typical paternity index (PI) were calculated using PowerStat version 1.2 software package [7].

The population from RS was compared with populations from the Parana State of Brazil [8] and the Central-East area of Argentina [9], in order to assess the genetic distance between these data, in a pairwise comparative analysis (F_{ST}) performed using Arlequin v3.5.1.2 software [10]. The genotype frequency distributions, summarized in [supplementary Table 1](#), showed no deviations from the Hardy–Weinberg equilibrium (HWE) by exact test method after applying Bonferroni's correction. The combined power of discrimination and power of exclusion for the NC01 and NC02 panels were 0.999997 and 0.972873, respectively. The genetic

distance, F_{ST} (see [supplementary Table 2](#)) was calculated between Rio Grande do Sul and both the Parana and the Central-Eastern Argentina population.

After Bonferroni's correction, our population sample had significant differences only when compared to Central-Eastern Argentina in three out of six loci (D10S1248, D14S1434, and D1S1677). The comparison between RS and Parana populations detected no significant differences ($F_{ST} = 0.00088$; p value = 0.099 ± 0.037). Five of the six loci showed acceptable levels of polymorphisms, with heterozygosities greater than 0.71, meaning that all these loci have a sufficiently high level of informativeness in the Brazilian population of Rio Grande do Sul and, for that reason, can be applied as genetic markers in paternity and forensic analysis.

In more complex cases of human identification, like sibship cases, parentage testing with other familial relationships or paternity testing with few genetic inconsistencies, the commercial kits can generate inconclusive data and the use of six miniSTRs can help in the elucidation of such cases. In situations with degraded DNA reduced STR size becomes an important tool when combined with another commercial kit miniSTR like AmpFℓSTR® MiniFiler™ PCR Amplification Kit (Applied Biosystems, Foster City, USA).

Conflict of interest statement

None.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.fsigen.2011.03.003](https://doi.org/10.1016/j.fsigen.2011.03.003).

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