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Population study of the F13B, LPL and HPRTB short tandem repeat polymorphisms in Sri Lanka

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Short tandem repeat (STR) loci or microsattelites are a subgroup of the highly polymorphic variable number of tandem repeats, which are used to identify individuals and determine family relationships by DNA typing. (STR) loci F13B, LPL and HPRTB can be analyzed by polymerase chain reaction (PCR) with locus specific primers. This reports the first application of STR typing of individuals in the Sri Lankan population for these three loci and presents allele and genotype frequency data establishing a database for the Sri Lankan population.

DNA extracted from whole blood using phenol-chloroform method or by Chelex-100, was amplified by PCR using locus-specific primers. The PCR products were visualized by denaturing polyacrylamide gel electrophoresis and silver staining. Alleles were assigned by comparison with a standard allelelic ladder. DNA profiles were generated in numerical form, and the results were analyzed by the PowerStats program. The distribution of observed allele frequencies for the three loci were obtained. The accuracy of making a DNA profile match using these three loci expressed as the power of discrimination (PD), and the Matching Probability (MP). Polymorphism information content (PIC), paternity index (PI) and power of exclusion (PE) were also calculated. The most common alleles were allele 10 for F13B (f=0.418), allele 10 for LPL (f=0.407) and allele 13 for HPRTB (f=0.450). The PIC values show that all three loci were highly informative (PIC>0.5). The PD values for the present loci showed a high power of discrimination ranging from 0.835 to 0.851. The combined power of discrimination for the three loci was 0.9963 or a match at all three loci in approximately 1 in 270 people in the Sri Lankan population. The combined typical PI for the three loci were 3.394. The combined PE for the three loci was 0.0513. Several more loci that show random association with the present STR loci need to be typed to increase the significance of any match. We have already published Sri Lankan population data for nine other STR loci. A preliminary Sri Lankan population database has been established for the STR loci F13B, LPL and HPRTB, and their suitability to be used in forensic casework has been assessed. The addition of three more STR loci will enhance the discriminating power of the DNA typing assays hitherto conducted in this country.

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