GENETIC VARIATION ANALYSIS FOR THIRTEEN STR LOCI IN THE FEDERAL DISTRICT POPULATION OF BRAZIL

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Genetic polymorphisms based on PCR amplification of Short Tandem Repeats (STR) have revolutionized forensic sciences as they combine several highly desirable characteristics for human identification purposes. In this work, a database of allele frequencies for 13 STR loci was constructed for the population of the Federal District (DF). These loci are: D12S1090, D3S1744, D18S849, CSF1PO, TPOX, TH01, F13A01, FESFPS, vWA, D16S539, D7S820, D13S317, D5S818.

Observed genotypic proportions at each locus are consistent with expected ones under Hardy-Weinberg Equilibrium and evidence of gametic phase linkage disequilibrium between loci are negligible. These results allow the estimation of genotype frequencies from allele frequencies and also warrant the use of the product rule to calculate the probability of occurrence of a multi-locus DNA profile.

High *a priori* exclusion probability (>99,99%) and power of discrimination (> 1 in 300 trillion) values demonstrate the efficacy of the combined use of these 13 STR loci for paternity and criminal investigations in Federal District population.

When the probability test was applied to compare Federal District allele frequencies with the three major American racial groups, significant deviations (P<0,05) were observed for the majority of the loci. However, no significant deviation was seen at twelve of the thirteen loci when Federal District allele frequencies distributions were compared to the combined American racial groups allele frequencies distributions. At the D18S849 locus the p-value (P=0,045) was borderline significant.

The consequences on profile frequencies estimates using different population databases were evaluated for the thirteen STR loci combined. From the forensic standpoint, estimates of multi-locus profile frequencies were significantly different when the DF database was used in comparison with any of the three American racial group databases. On the other hand, no significant differences were observed when the profile frequencies obtained from the DF database were compared to those obtained with the database combining all three American racial groups.