EVALUATION OF POPULATION GENETIC DATA OF 15 SHORT TANDEM REPEAT MARKERS IN PAKISTAN FOR THE ESTABLISHMENT OF DNA DATABASE

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Allele frequencies and various statistical parameters of 15 autosomal short tandem repeat (STR) DNA markers (D8S1179, D21S11, D7S820, CSF1PO, D3S1358, THO1, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818 and FGA) were evaluated from a sample of 661 unrelated individuals, living in Khyber Pakhtoonkhwa, Southern and Central Punjab province of Pakistan. D8S1179, D21S11, D7S820, CSF1PO, D3S1358, D13S317, D16S539, D19S433, vWA, D18S51 and FGA were found to be highly polymorphic with observed Heterozygosity > 70%.THO1 and TPOXwas least polymorphic with observed Heterozygosity 50 and 34.2% respectively. The investigation of statistical parameters revealed that D2S1338 showed highest power of discrimination, power of exclusion, typical paternity index, and polymorphism information content followed by D18S51, FGA, D8S1179 and vWA. Maximum matching probability was observed in case of THO1, while D2S1338 showed minimum matching probability. The combined random match probability of these STR markers was found to be 3.1×10^{-21} in Pakistani population. Therefore, evaluated allelic frequency data and parameters for forensic application would not only be useful for identification of individuals but also lead as a foundation for the establishment of STR database in Pakistan.

Keywords: Short tandem repeats (STR), Pakistan, allele frequencies, heterozygosity, matching probability, polymorphism information contents