Title : Microsatellite DNA Analysis on DXS6789 in Thai Males Apply for Forensic Science.

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ABSTRACT

Microsatellites are repetitive sequences of nucleotides typically 2 to 6 base pairs long which were found throughout the genome of living organisms. Due to their high degree of variability compared to other regions of DNA, they contribute to significant genetic diversity and are well-suited for forensic applications, particularly in individual identification and paternity testing. This research focuses on the characteristic analysis of microsatellites on the X-chromosome locus DSX6789 in a Thai male population and investigate the genetic variations that could be useful in forensic investigations. Buccal swab samples were collected from 50 Thai male volunteers aged between 20 and 60 years old. Genomic DNAs were extracted using the NucleoSpin® Tissue kit, resulting in a genomic DNA size of approximately 20 kb. Polymerase chain reaction (PCR) was employed to amplify the partially DXS6789 locus and gel electrophoresis revealed a PCR product size of about 300-400 bp on the DXS6789 locus. The amplified DNA was purified using the AccuPrep PCR/Gel Purification kit. An investigation on the microsatellite repeat patterns revealed two types of nucleotide repeats on the DSX6789 locus: $TATC(TATG)_n(TATC)_n$ and $(TATG)_n(TATC)_n$. A study of DNA samples from a group of Thai males revealed nine distinct patterns of repeated nucleotide sequences: $TATC(TATG)_{10}(TATC)_9$, $TATC(TATG)_{10}(TATC)_{10}$, $TATC(TATG)_9(TATC)_7$, $TATG_{10}TATC_6$, $TATG_9TATC_6$, $TATG_{11}TATC_6$, $TATG_8TATC_7$, $TATG_{10}TATC_5$, $TATG_{10}TATC_{10}$, with allelic frequencies of 0.18, 0.06, 0.02, 0.34, 0.30, 0.04, 0.02, 0.02 and 0.02 respectively. Based on these frequencies, the Power of Discrimination (PD) and Polymorphic Information Content (PIC) were calculated as 0.718 and 0.755, respectively. These findings demonstrate the diversity of the DSX6789 locus in Thai males, which suggesting its potential for effective forensic applications in both individual identification and paternity testing.

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