

Abstract

Mitochondrial DNA (mtDNA) has several characteristics useful for forensic studies, especially related to the lack of recombination, high copy number, and maternal inheritance. Mitochondrial DNA typing based on variations analysis of the control region is used in forensic investigation from different biological samples. Mitochondrial genetic studies have limited availability in EMPOP dataset to identification of maternal lineages and assessment genetic diversity patterns of the Iraqi population. The study aimed to detection of mtDNA control region variations that represent the forensic genetic markers of the Iraqi population. The complete control region were amplified from 203 blood samples collected from healthy unrelated individuals in subsequent three generations at Al-Samawah city, followed by Sanger sequencing. Mitochondrial haplotypes and haplogroups were detected and statistical analyses were calculated including random match probability and nucleotide diversity. The DNA Sequencing of mtDNA showed 143 polymorphic positions within control region that analyzed to high frequency of polymorphic nucleotide were (7.9%), (10.4%), (6%), (10.5%) and (6.3%) at positions 73, 263, 309, 315 and 16519. The highest frequency of haplotype was (16069T, 16126C, 16311C, 73G, 150T, 152C, 195C, 235G, 263G, 295T, 309.1C, 315.1C, 489C) shared in 6 individuals and is unique haplogroup in all EMPOP dataset. The Mitochondria haplogroup composition that showed frequency of haplogroup U, H, J, R, L, T, N, M, K, W, X, I and C were (22%), (9.98%), (5.46%), (10.9%), (9.9%), (7.9%), (6.9%), (5%), (4.4%), (2.4%), (1.98%) and (0.5%) respectively. The genetic diversity and probability of a random match between two unrelated individuals of the Iraqi population sample set were 0.99 and 0.005, respectively. The Iraq mitochondrial haplotypes were assigned to known haplogroups which served to identify the maternal ancestry of the modern Iraq population and to uncover their genetic relationships to other neighbor populations. Finally, our results registered that Iraqi population share to characteristics of the west Asian population, European populations and distant from central Asian population.