EVALUATION OF DNA EXTRACTION METHODS FROM HUMAN BONE SAMPLES FOR MITOCHONDRIAL DNA AND STR ANALYSIS

K. Sekiguchi, K. Yoshida, H. Mizuno, H. Senju, K. Fujii, K. Kasai
National Research Institute of Police Science, Kashiwa, Japan

In order to develop a rapid and less laborious DNA extraction method from bones for mitochondrial DNA and STR analysis, several methods were compared. DNA was purified from a human skull (a six-year-old boy missing for seven months) with phenol-chloroform method, QIA® DNA Blood Midi Kit (QIAGEN Inc.) and Tissue NucleoSpin Kit/NucleoSpin Funnel Column (MACHEREY-NAGEL GmbH & Co.KG). Each extracted DNA was amplified on mitochondrial DNA (mtDNA) HVI and HV2 region and on STR loci using AmpF/STR Profiler™ Kit (Applied Biosystems), AmpF/STR Profiler Plus™ + AmpF/STR COfiler™ top fill (Applied Biosystems) and PowerPlex®16 System (Promega Corp.). Mitochondrial DNA was amplified and successfully sequenced with all the extraction methods, and the efficiencies of mt DNA amplification were comparable among the methods. However, drying up the extract of QIAamp® Kit was required to remove ethanol. Several small peaks on STR loci were observed only from DNA extracted with Nucleon™ Kit, but complete STR typing results could not be obtained due to preferential amplification on some loci. The DNA extracted by the remaining methods did not give any detectable peaks on STR loci. This indicated the difficulty of nuclear DNA typing from bone samples.