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APPLICATIONS OF A KIT- BASED TECHNOLOGY IN FORENSIC MITOCHONDRIAL DNA (MTDNA) ANALYSIS OF HUMAN HAIR SHAFTS

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Analysis of mitochondrial DNA (mtDNA) sequence from human hair shafts has proven to be a valuable complement in forensic cases where nuclear DNA typing is not possible. Prior to mtDNA sequencing, the cleaning and extraction processes of the hair shafts from contaminants and adhering materials are the most crucial steps. This is to ensure that the sequence of the mtDNA obtained originates from the sample and not from the exogenous human DNA. Verification studies have been conducted in our laboratory using a QIAamp® DNA Micro kit (QIAGEN, Germany) to assess whether this system can be successfully applied to forensic casework. Here, we demonstrate a case study where burnt scalp hair and items, allegedly belongings of the victim were analysed. Amplification and sequencing analysis were performed at two segments of the mitochondria DNA, namely HV1 and HV2 regions. All sequences obtained from the samples were compared to the Revised Cambridge Reference Sequence (rCRS). The sources of the evidentiary samples indicated them to be of the same maternal lineage with that of the allegedly mother.