

Reliability of Dry Tissues Sampled from Exhumed Bodies in DNA Analysis

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Abstract : In cases of corpse identification or parental testing performed on exhumed alleged dead father, usually, we seek and acquire organic samples as bones and/or bone fragments, teeth, nails and muscle's fragments. The DNA analysis of these cadaveric matrices usually leads to identifying success, but it often happens that the results of the typing are not satisfactory with highly degraded, partial or even non-interpretable genetic profiles. To aggravate the interpretative panorama deriving from the analysis of such 'classical' organic matrices, we must add a long and laborious treatment of the sample that starts from the mechanical fragmentation up to the protracted decalcification phase. These steps greatly increase the chance of sample contamination. In the present work, instead, we want to report the use of 'unusual' cadaveric matrices, demonstrating that their forensic genetics analysis can lead to better results in less time and with lower costs of reagents. We report six case reports, result of on-field experience, in which eyeswabs and cartilage were sampled and analyzed, allowing to obtain clear single genetic profiles, useful for identification purposes. In all cases we used the standard DNA tissue extraction protocols (as reported on the user manuals of the manufacturers such as QIAGEN or Invitrogen- Thermo Fisher Scientific), thus bypassing the long and difficult phases of mechanical fragmentation and decalcification of bones' samples. PCR was carried out using PowerPlex® Fusion System kit (Promega), and capillary electrophoresis was carried out on an ABI PRISM® 310 Genetic Analyzer (Applied Biosystems®), with GeneMapper ID v3.2.1 (Applied Biosystems®) software. The software Familias (version 3.1.3) was employed for kinship analysis. The genetic results achieved have proved to be much better than the analysis of bones or nails, both from the qualitative and quantitative point of view and from the point of view of costs and timing. This way, by using the standard procedure of DNA extraction from tissue, it is possible to obtain, in a shorter time and with maximum efficiency, an excellent genetic profile, which proves to be useful and can be easily decoded for later paternity tests and/or identification of human remains.

Keywords : DNA, eye swabs and cartilage, identification human remains, paternity testing

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