

COMPARISON OF TWO DNA ISOLATION METHODS FROM HUMAN SKELETAL REMAINS FOR STR ANALYSIS

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We have compared a standard organic DNA isolation method and a silica-based method to obtain human DNA from bone samples in paternity testing cases.

DNA was isolated from Thirty Nine (39) bone samples with a standard organic DNA isolation method (provided by AFDIL) and a silica-based DNA isolation using the Qiagen Blood Maxi Kit as recommended by the International Commission of Missing Persons (ICMP)¹. DNA samples were quantified by real time PCR using the Plexor HY system and STR profiles obtained using Powerplex 16 and Identifiler STR kits. Overall, the silica-based method showed less DNA recovery, 0 ng/ul to 9.4ng/ul (Median= 0.50 ng/ul) while with the organic method, DNA concentrations ranged 0 ng/ul to 22 ng/ul (median = 1.61 ng/ul). Full STR profiles were obtained in 37/39 samples (95%) using the organic method compared to 9/39 samples (23%) with the silica-based method. Our results indicate that the published silica-based method does not improve either the quality or quantity of DNA for STR profiling compared to a standard organic DNA isolation method. In addition, our results indicate that decalcification of bone samples with EDTA did not decrease the amount of DNA recovered contrary to what has been thought in the past. This result is based on the fact that the silica based isolated samples were not subjected to EDTA decalcification as opposed to the organic extracted samples.

Reference:

¹ Davoren J, Parsons TJ. Highly effective DNA extraction method for nuclear short tandem repeat testing of skeletal remains from mass graves. Croatian Medical Journal. 2007; 48: 478-85