B4 The Effects of Different Environmental Factors on Quantity of DNA Extracted From Skeletal Remains Recovered From Gravesites in Former Yugoslavia and Quality of DNA Typing Results

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The goal of this presentation is to present data which will reflect upon the quality of the obtained STR profiles and the quantity of DNA extracted from bone samples taken from skeletal remains that were exposed different environmental influences, and the observed differences between them.

This presentation will impact the forensic community and/or humanity by providing information to persons performing DNA STR testing of skeletal remains from mass graves.

The International Commission on Missing Persons has been tasked with the challenge of identifying mortal remains from the armed conflicts in the former Yugoslavia that occurred in the 1990s. This process is complicated due to several factors: at least nine years have passed since the conflicts ended, there are up to 30,000 missing persons in graves scattered throughout the former Yugoslavia, the conditions of the mortal remains being recovered, and because DNA testing has become the only reliable means of identification in the majority of these cases.

In the ICMP's identification efforts, bodies have been found buried in mass graves of up to hundreds of bodies. Within the same grave remains are often exposed to a number of different conditions as some were buried in body bags, others were wrapped in plastic and some were in direct contact with either soil or with other bodies. Many sets of mortal remains have also been burned prior to being placed in the mass graves.

DNA testing of skeletal remains is a rather challenging task because the DNA in such bone samples is generally highly degraded. In addition, it is normal that a substantial microbial population infests the bone samples. The process is further complicated because of the diverse storage conditions in which bodies were placed at time of death. The ICMP has developed a DNA-led identification process that is successful in obtaining STR profiles in over 85% of the skeletal cases from the former Yugoslavia. In order to further optimize this testing process the authors are investigating the effects of the environmental conditions of the mass graves to see if there is any link between those conditions and the recovery of DNA from bones.

To determine the effects of environmental factors on the degradation of DNA, multiple bone samples from two different disposal sites were examined. The pH values of soil samples from those two gravesites were measured. Survey data of gravesites was collected with information on depth and position of bodies within the grave. Factors pertaining to conditions of bodies such as: whether bodies were burnt, whether plastic sheeting was used to wrap bodies and whether bodies were buried in body bags were also noted and considered.

The relative DNA content of bone samples from those specific locations was determined by quantification of DNA extracted using The Quantifiler™ Human DNA Quantification Kit and ABI Prism® 7000 Sequence Detection System.

STR Typing was performed using the commercially available Promega PowerPlex® 16 System.

The data presented will reflect upon the quality of the obtained STR profiles and the quantity of DNA extracted from bone samples taken from skeletal remains that were exposed different environmental influences, and the observed differences between them.

DNA, STR, Degradation

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