THE EFFECT OF VARIOUS DECOMPOSITION ENVIRONMENTS AND ELAPSED TIME AFTER DEATH ON THE COSTAL CARTILAGE DNA

In Kwan Hwang, Young Eun Kim, Jin Young Kim, Seong Jun Park, Hyun-Jung Lee, Jung Sik Jang, Department of Forensic Medicine

STR analysis of costal cartilage DNA is crucial for rapid identification of decomposed bodies that do not have any blood left. This study was carried out to investigate the effect of various decomposition environments such as reservoir, river, mountain, house and estimated elapsed time after death on the costal cartilage DNA. We examined the amount of DNA in various decomposed samples through quantification by Nanodrop and Real-time PCR (RT-PCR) and the DNA degradation level was determined by the Degradation Index (DI) provided by the Quantifiler® Trio Kit. The quantification value by Nanodrop was higher in all the samples, ranging from 1.2 to 702.2 times that of RT-PCR. We have found that the DI values for determining the level of degraded DNA range from a minimum of 0.65 to a maximum of 2.71, which was almost identical to the expected degree of decomposition. These results can be used to estimate the decomposition environment and elapsed time after death that affect the amount of human DNA in the decomposed costal cartilage, and to predict the quality of the DNA profile before the STR analysis.

Keywords : costal cartilage, decomposition, elapsed time after death, Nanodrop, Quantifiler® Trio Kit, degraded DNA