

Study on comparison of DNA detection rates in fire debris according to fire exposure temperature-time and distance to Ignition point**Yang Jung Kim**

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DNA profiles from evidence found at crime scenes can be instrumental to identify a criminal in criminal investigations. But the key evidence from crime scenes often contains very little DNA or degraded DNA by heat and light. Fire investigation is the examination of fire-related incidents and similar to the examination of crime scenes. Fire investigation also includes surveying the damaged scene to establish the origin of the fire and eventually establishing the cause and the fire whether or not crime-related. It is difficult to determine whether arson has occurred because fire debris including the key evidence of fire origin is often seriously damaged or contaminated by fire fighting water, fire extinguisher besides fire. To clarify the correlation of DNA detection rates and evidence collection rates according to fire exposure temperature-time and distance to ignition point, in this study, we first analyzed fire investigation cases including arson cases in Busan metropolitan city where 350 million people live. For this purpose, we also conducted fire simulation experiments of DNA evidence samples. In addition, we performed a quantitative PCR (qPCR) assay to quantify total DNA and the extent of DNA degradation and we compared detection rates of STR profiles of blood, saliva samples in the fire exposure temperature condition at 100°C to 800°C and distance to ignition point from 1 m to 3 m. STR profiles of blood sample were obtained in the fire exposure condition at 300°, 10 sec to 60 sec. STR profile has not been detected or evidence disappeared in the fire exposure condition above 300°C, 60 sec. The distance to ignition point is farther, more complete STR profiles and evidences were obtained.

Biography

Yang Jung Kim is the Chief of Busan Forensic DNA Smart Lab, National Forensic Service. She has completed her Master's degree from Busan National University and has worked for more than 15 years at Forensic DNA Division, National Forensic Service.

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