STUDY ON COMPARISON OF DNA DETECTION RATES IN VARIOUS FIRE DEBRIS EVIDENCES COLLECTED FROM FIRE SCENES

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In general, fire investigation is focused on origin and cause investigation such as ignition source and fuel. After fire fighters extinguish a fire, an investigation is launched to determine the origin and cause of fire. Fire investigation is the analysis of fire related incidents and begins with collecting the circumstantial evidence of a fire including fire remains. In addition, it is important to investigate whether the fire is a crime-related or not. It is difficult to determine whether arson has occurred because fire destroys fire scene including the key evidence of fire origin and fire debris is often seriously damaged or contaminated by fire fighting water, fire extinguisher. In particular, DNA detection is occasionally key evidence in fire and arson investigation, but it is rare to find a fire debris evidence capable of detecting DNA.

In forensic fire investigation, DNA analysis performed to discover origin of fire, identify DNA of arsonist or unknown dead and solve hidden violent crime such as murder. Sometimes crime tools or clothes were burned by criminal for destruction of evidence. Therefore various type of researches to increase DNA detection rate are necessary for reconstruction of a fire scene and to arrest a arsonist and criminal.

In this study, 385 fire debris evidences from fire scenes occurred in Gyeongsangnam-do area from 2008 to 2015 were analyzed to detect DNA.

And then estimation of DNA detection rate was analyzed based on types of evidence sample such as blood, saliva and touched DNA. The type of evidence, including cigarette butts, lighter, butane gas cartridge, etc. were classified separately.

DNA from blood and cigarette butts were mostly isolated however rarely detected in touched DNA that closely related to the cause of the fire such as lighter, butane gas cartridge, matchstick and candlestick.