COMPARATIVE ANALYSIS OF SIMULATED DVI SAMPLES VIA RAPID DNA AND CONVENTIONAL DNA TYPING METHODS

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The use of Rapid DNA testing has already proved to be a valuable tool for typing buccal swabs or blood and saliva samples from crime scenes. Quality assurance standards for the use of the Rapid DNA technology for DNA databasing have recently been established. The short analysis time as well as the portability makes Rapid DNA instruments attractive for typing disaster victim identification (DVI) samples. The scene of an accident may be far away from a common DNA lab and/or badly accessible.

To test the suitability of the Rapid DNA approach on decomposed tissue samples we decided to type simulated DVI samples in a comparative study with the RapidHIT™ instrument (IntegenX) and our conventional in-house DNA analysis methods. Therefore 112 Samples were collected from twelve decomposing bodies that were found between one day and four months after death. Wherever possible, two sets of swabs were taken from inner gallbladder, inner urinary bladder, muscle and bone marrow. Using the GlobalFiler® (Life Technologies), one set of samples was typed with the RapidHIT™ instrument (crime stain protocol), the second using ChargeSwitch® automated extraction followed by Alu-rtPCR based quantitation. Data analysis was performed using GeneMapperID-X 1.3 (Life Technologies).

Unexpectedly, the DNA analysis via Rapid DNA approach produced surprisingly good results with decomposed dead body samples from the varying tissue sources. We could demonstrate that the technology is suitable for successful typing of problematic samples even if the in-house typing showed a superior data quality. Interesting issues and limitations concerning data quality and evaluation, sample type and dead body age as well as important recommendations on how to process and evaluate the Rapid DNA profiles will be presented in detail.