

EVALUATION OF A ONE-STEP DNA EXTRACTION METHOD FOR “TOUCH” SAMPLES

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Due to advances in DNA typing technologies, it is possible to generate a DNA profile from touched objects or trace amounts of biological material (< 100pg). Therefore, it is important to ensure that sample collection and DNA purification methods recover the maximal amount of DNA from each sample. The Fingerprint DNA Finder (Nexttec™, Germany) is a fast (30 min digestion + 4 min purification) and simple DNA extraction system using a single buffer and a one-step DNA purification based on a reversal of the silica principle used by many commercial DNA extraction kits. In this study, two versions of the FDF® kit (one with, and the other without a 50% reduction in the amount of sorbent in the spin column) and the QIAamp DNA Investigator kit (Qiagen) were used to evaluate DNA collection and extraction methods for “touch” samples. This study compared the quantity and quality of DNA retrieved from touched objects (smooth and rough surfaces) using swabbing and tape-lift+swab techniques, and extracted using the original FDF® system, the modified (reduced) FDF® column and the QIAamp DNA Investigator kit.

Results of this study demonstrate that the FDF® kits are capable of extracting high quantity and quality DNA from “touch” evidence, using both swab and tape-lift+swab methods. More than three times the amount of DNA was recovered from rough surfaces using the tape+swab method compared to swabbing (regardless of DNA extraction method used). The DNA Investigator kit produced the highest DNA yields from all samples. However, both FDF® formats produced more concentrated DNA extracts and higher STR success rates for all samples compared to the Investigator kit. Overall, the FDF® reduced format (50% less sorbent) performed the best in this study, generating the most concentrated DNA extracts and most complete STR profiles from “touch” samples.