DNA EXTRACTION AND STR PROFILING USING LEFTOVER MATERIAL FROM AN IMMUNOCHROMATOGRAPHIC TEST STRIP ASSAY

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Recently, a novel immunochromatographic test strip assay, the SERATEC® PMB Test (Seratec GmbH, Göttingen, Germany, Holtkötter et al. Int J Legal Med. 2017), was developed. The assay combines the detection of human hemoglobin and D-dimer for human blood and/or human menstrual fluid detection in a forensic sample. Since usually only limited material is present for analysis it was examined whether leftover material from the test strip was suited for DNA extraction and STR profiling. Body fluids (blood, menstrual fluid, mixtures of menstrual fluid with semen and saliva) were analyzed on the PMB tests according to protocol. Then, two sources of DNA for extraction were evaluated: (1) DNA from the sample pad and (2) DNA from the remaining sample-buffer solution used for running the assay. For method 1, the strip test's plastic cartridge was opened; the sample pad was cut out and transferred to a reaction tube. For method 2, 100 µl of sample-buffer-solution were transferred to a reaction tube. For both methods DNA was extracted using the Maxwell® instrument and amplified using the PowerPlex® ESX 17 Pro System (Promega, Mannheim, Germany) according to manufacturer's recommendations. Samples were subsequently analyzed using the 3130 Genetic Analyzer with the GeneMapper® ID software by Thermo Fisher Scientific. It was possible to extract sufficient DNA from both the sample pad as well as the sample-buffer solution necessary for amplification. DNA analysis was successful as complete, high quality DNA profiles were generated. No significant differences in peak height or quality of the profiles were observed between the two collection methods. It was shown that both sources of DNA are convenient and suited for DNA analysis, and that the strip test assay is easily incorporable into standard forensic laboratory work.