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SPERM DNA EXTRACTION EFFICIENCY FROM MIXED STAINS USING THE DIFFEREXTM SYSTEM

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Much of the critical evidence at a crime scene may be in the form of trace quantities of various biological materials. Fortunately, recent technological developments enable the identification of genotypes from very minute specimen quantities. This makes DNA typing a critical and powerful tool for criminal investigations, particularly sex crimes. Although specimens from crime scenes typically include blood or blood stains, in the case of sexual crimes such as rape, specimens often involve a mixture of stains of different sources, including sperm-oral cells or sperm-vaginal cells. In recent years, the introduction of multiplex PCR kit for Y-STR have given us the ability to rapidly type many sperm loci. But for autosomal DNA typing of sperm from mixed stains, we need to isolate and extract sperm DNA by the two-step method (or the two-step differential extraction procedure). The drawback of the two-step method is that it requires at least one or two days to complete. Recently introduced by Promega (Madison, WI, USA), the DifferexTM System kit combines phase separation and differential centrifugation to separate sperm and epithelial DNA. This kit reduces the time required to extra sperm DNA from mixed stains to approximately two hours, considerably faster than other methods. In this study, mixed stains composed of cells at various concentrations from female epithelial cells and sperm were placed on a cotton swab, after which we compared the extraction efficiency of this system and that of the two-step method. The extracted sperm DNA from the mixed stains were amplified using a human identification kit. Electrophoresis was performed on an ABI 310 Genetic Analyzer, and alleles were determined by GenoTyper 3.7 software.