

DNA typing from persimmons helps solve a murder case

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Abstract. As is well known, saliva is considered a good piece of evidence to obtain full DNA profiles. In this case, we report a murder occurred in a small village near Venice, in which, among other trace evidence, three persimmons were collected from a garden, just outside the crime scene. The fruits were bitten by someone linked to the murder, just before he entered the victim's house. Due to consistency of the persimmon and the DNA degradation caused by bacteria and fungi easily proliferated in the sugar content of the fruit, we decided to sample the small amount of saliva left by the suspect, with three dacron swabs, which was gently rubbed on the fruit as soon as the evidence came into our lab. We then processed through DNA extraction, quantification, amplification and typing by multiplexing STRs analyses, using the commercially available kits. An almost complete STR profile was obtained from two out of three of the swabs used. This profile was then compared with several individuals and allowed us to identify the person who bit into the fruit. This person was then questioned, and he not only admitted his guilt but also gave the police new leads that allowed the authorities to catch the rest of the criminals. © 2006 Published by Elsevier B.V.

Keywords: DNA typing; Saliva

1. Introduction

Immediately after a murder, which occurred in a small village near Venice, three persimmons were collected from a garden outside the crime scene and sent to our lab for DNA analyses. As soon as they arrived, we decided to swab the exhibits on different pulp area of each of the fruits, in order to collect all the possible saliva residues left. Residual cells from two out of three swabs were correctly typed and showed to be still useful for forensic genetics purposes, although persimmons are rich in water and sugars that promote bacterial and fungi proliferation.

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Fig. 1. Blu-dye pherograms comparison between suspect and saliva evidences.

The profiles we obtained were then compared with 16 different reference samples of potential suspects that were collected during the investigation.

2. Materials and methods

Swabs used for sampling the persimmons were submitted to phenol–chloroform DNA [1] extraction, followed by quantification with Slot-Blot procedure using Quantiblot kit [2,3] (ABD). Results were analyzed with GeneGnome (Syngene Bio Imaging) with Slot Quant Software (Hitachi v. 2.1.5.5). Genotyping was performed by PCR using Identifiler (ABD), according to the original protocols. PCR fragments were separated with capillary electrophoresis using ABI Prism 310 Automatic Sequencer (ABD) and the size call allele was done by GeneMapper v. 3.2 (ABD).

3. Results and discussion

Three samples among those used to collect saliva showed a yield of genomic DNA ranging between 10 and 40 pg/μl.

Nevertheless, two out of the three samples processed, as illustrated in the inferograms below, showed an almost complete STR profile, which was obtained from a DNA quantity ranging from 50 to 200 pg (as total DNA target in the PCR solution) (Figs. 1–4). The DNA



Fig. 2. Green-dye pherograms comparison between suspect and saliva evidences.

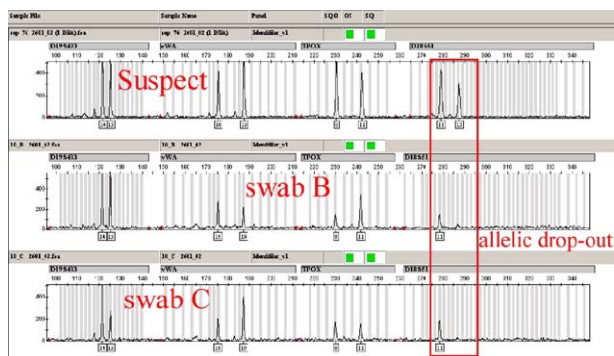


Fig. 3. Yellow-dye pherograms comparison between suspect and saliva evidences.

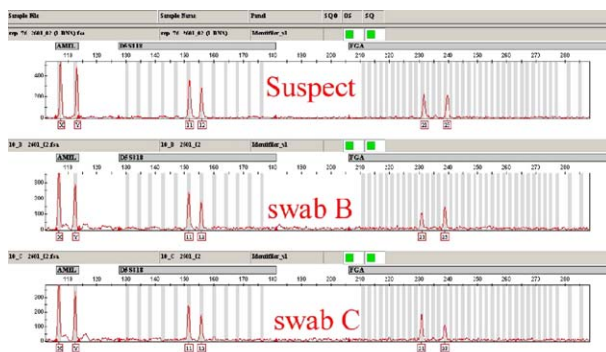


Fig. 4. Red-dye pherograms comparison between suspect and saliva evidences.

peak values varied between 100 and 1800 RFU for the different loci and stochastic effects occurred only at the D18S51 locus (allelic dropout).

Although it seemed quite impossible to achieve useful results, the saliva collected from the persimmon was enough to obtain reliable DNA typing that, when compared with the suspects, led the investigators to a final match of crucial importance. In fact, thanks to the DNA match, many other leads were found and all confirmed the guilt of the suspect, first caught by the genetic approach.

Once more, this case confirms the importance of investigators' quickness and ability at the crime scene since, as less time elapses from the collection of the evidence, the more likely it is to obtain good results in DNA isolation and typing, even from samples, as the persimmons in this case, naturally exposed to a fast DNA degradation.

References

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