

THE RECOVERY OF MITOCHONDRIAL DNA FROM THE ATTACHED SIDE OF SELF-ADHESIVE STAMPS

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The ability to recover a genetic profile from the backs of self-adhesive stamps holds significant implications to the field of forensic science. This knowledge is pertinent in cases in which stamp evidence is commonly encountered; examples include extortion, threats, and kidnapping, where identifying the individual source of DNA may prove pivotal in criminal investigations. In 1994, the U.S Postal Service discontinued the sale of water-activated stamps and replaced them with a pressure sensitive self-adhesive stamp. The self-adhesive stamp provides an alternative evidentiary source of DNA—DNA from fingerprint residues or “touch” DNA. Thus, there is a need to develop a method to successfully obtain a DNA profile from this alternate source of evidence.

In order to determine the feasibility of recovering “touch” DNA from self-adhesive stamps, research subjects were instructed to affix self-adhesive stamps to envelopes and postcards. Prior to extraction, the image-side of the self-adhesive stamps was exposed to UV light for 10 minutes to decontaminate the external surface of the stamp. The stamps were extracted with phenol: chloroform: isoamyl alcohol and the extracts were purified and concentrated using Centricon® 100 microconcentrators. The extracted products were amplified and a haplotype was obtained using the LINEAR ARRAY™ Mitochondrial DNA HVII/HVII Region-Sequence Typing Kit.

Four hypotheses were tested to examine the factors that may influence the recovery of mtDNA profiles from the attached side of self-adhesive stamps. The recovery success for each research subject was calculated to determine whether the recovery of mtDNA profiles varies among subjects. In addition, Chi square analysis was performed to test the null hypothesis that there is no difference in recovery between self-adhesive stamps affixed to envelopes in the morning as opposed to the afternoon/evening. Chi square analysis was also used to evaluate the null hypothesis that there is no difference in recovery between freezer-stored and mailed samples. Finally, Chi square analysis was performed to test the null hypothesis that there is no difference in recovery between self-adhesive stamps affixed to envelopes v. postcards.