EXAMINATION OF STAMPS ON POSTCARDS AND LETTERS FROM THE EARLY AND MID-1900'S FOR THE RECOVERY OF DNA

Maher Noureddine, Ph.D.[1], James A. Bailey, Ph.D.[2], Alice Squassina[3], Santina Casticiano[3], and Giorgio Triva[3]
[1] ForensiGen, LLC, Oak Ridge, NC
[2] Minnesota State University Mankato
[3] COPAN Italia Spa, Brescia Italy

Some letters and postcards sent through the U.S. postal service are collected as items of physical evidence in some investigations. Police and news agencies occasionally receive correspondence from unidentified persons claiming responsibility for certain crimes. Recovering DNA from items of correspondence can aid the criminal investigation in identifying or eliminating potential suspects. There were no self-adhesive postage stamps issued in the United States from 1900 to 1955. Stamps were moistened with either a sponge, ceramic roller or with the surface of the tongue. The purpose of this experiment is to test the adhesive surfaces on the back of postage stamps affixed to letters or postcards to determine the persistence of DNA over a 55-year period. Stamp-bearing envelopes and postcards mailed between the year 1900 and 1955 were collected in approximately one-year increments. Each stamp was peeled off gently with sterile forceps while being exposed to a column of continuous steam for approximately 10 sec to neutralize the adhesive. To collect samples for DNA analysis, the adhesive side of the stamp and the opposing area on the envelope or postcard were swabbed with COPAN® 4N6FLOQSwabs™ (Copan Italia, Brescia, Italy) that were pre-wetted with sterile water. DNA samples were extracted using the COPAN nucleic acids optimizers (NAO), a semi-permeable basket which retains fluid until centrifuged with the PrepFiler Express™ on the AutoMate Express™ DNA Extraction System by Life Technologies. DNA quantitation was performed using the Quantifiler® Trio DNA Quantification Kit (Life Technologies). The AmpFLSTR® Identifiler® Plus PCR Amplification Kit by Life Technologies was used for DNA amplification, the fragments were run on the Applied Biosystems® 3130 Genetic Analyzer by Life Technologies and the analysis was performed with GeneMapper® ID-X v1.4. The results demonstrate the effectiveness of the experimental procedure in recovering DNA from control samples. Out of 60 stamps analyzed, one stamp from 1912 yielded a full DNA profile and two stamps from 1914 and 1933 yielded useful partial profiles. A set of 22 stamps yielded between 1 to 4 alleles each that can potentially be used for exclusion purposes. These 22 stamps can be tested with other DNA profiling kits or, if needed, with mitochondrial DNA analysis. No DNA data was obtained from the remainder of the stamps. These results indicate that while DNA profile data can be obtained from the adhesive of stamps from 1900 to 1955, practitioners should consider the potential for negative DNA recovery.