B35 United States Transferable Fiber Census

Sara Linker, BS, University of Central Florida, PO Box 162367, Orlando, FL 32816; Katie Steele, BS, 1643 Riveredge Road, Oviedo, FL 32766; Holly Miller, BS, and Rebecca Smith, BS, University of Central Florida, PO Box 162367, Orlando, FL 32816; Max M. Houck, MA, West Virginia University, Forensic Science Initiative, 3040 University Avenue, PO Box 6217, Morgantown, WV 26506-6217; and Michael E. Sigman, PhD, University of Central Florida, National Center for Forensic Science, PO Box 162367, Orlando, FL 32816-2367*

The goal of this presentation is to inform trace analysts of rapid method for estimating the transferable fiber population in a given area and to provide an estimate of the current transferable fiber population taken from different geographical areas in the U.S.

This presentation will impact the forensic community by providing a basis for estimating the statistical significance of fiber trace evidence.

The results of the survey are intended to assist the analyst in identifying evidentiary values for fibers from different color and type classifications. Similar studies were compiled but, currently there is no definitive reference for fiber evidence in the United States; the aim of this project is to construct an internet accessible database containing the results from fiber surveys taken at different locations throughout the United States at differing times of the year.

The initial analysis of fiber distribution is based on data sampled from four locations; Florida, Virginia, Texas, and Illinois. Samples were collected with one of two methods; an electrostatic collection by physical wiping and an adhesive tape lift. The sampling method developed for the tape lift set of fibers is unique in that it is not biased toward dyed fibers as in the electrostatic method. The common method of sample retrieval using a tape lift has been modified in this project to allow for direct microscopic analysis of the lift. In the modified tape lift method, the cellophane tape used to lift the fibers is place on top of at second piece of the same tape oriented at a 90° rotation. The advantage of this method of sample collection is that the tape will retrieve all fibers in the background, and the lift can be directly analyzed therefore removing potential subsampling bias from the method.

Fibers were categorized into one of eleven generic fiber classes and one of six color classes. The current results indicate a distribution of cotton (65%), acetate (10%), and nylon (4%) as the most commonly found fiber types in the combined population with variations in the subsets of time of year and location. The least common fiber types were linen (1.1%) and silk (0.4%). The most common color types were un- dyed (35%), blue (28%), and black (19%). The most common fiber type/fiber color combinations were un-dyed cotton (26%), blue cotton (23%), and black cotton (7%). Uncommon fiber type/fiber color combinations were acrylic/green, silk/red, rayon/green and wool/green at less than 0.2%. The distribution of color type within each fiber class was not uniform, although a majority of the fibers in most classes were un-dyed. The fiber census is intended to be an ongoing sample collection and analysis process updated to remain consistent with varying trends in the textile industry.

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Fiber Evidence, Fiber Population, Microscopic Analysis of Fibers

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