1.2 Saliva Detection

There are no tests available to conclusively identify saliva. Therefore, its presence may be inferred on items such as drinking containers, envelope flaps, chewing gum, cigarette butts, etc. without testing being conducted. However, if deemed informative, the following methods may be utilized to indicate the possible presence of saliva.

1.2.1 Alternate Light Source (ALS)/Ultraviolet (UV) Light

1.2.1.1

Emitted fluorescence may aid in the location of stains believed to contain saliva. The fluorescence helps merely to localize areas for more detailed examination; it does not have any value by itself in the identification of any specific body fluid stain.

1.2.1.2

Lack of fluorescence does not prevent additional testing from being performed, if deemed necessary.

1.2.1.3

Screening items such as masks, clothing or bedding for the presence of saliva stains may be facilitated by the use of an alternate light source (ALS). Alternate light sources include a UV light (sometimes referred to as a "Wood's Lamp" by Forensic Nurses), the Omnichrome, Mini-Crimescope MCS-400, or Foster+Freeman Crime-Lite® 82S, to name a few. Users must read the directions accompanying each ALS in order to learn the best combination of wavelengths and filters, to avoid damaging the instrument during start up and shut down, and to protect their eyes from the powerful light. The use of appropriate goggles (dependent on the ALS) helps to make the reaction detectable to the eye, while simultaneously protecting the eyes from the light source. If proper eye protection is not worn, permanent damage to the eye may occur.

The principle behind the light sources is that biological fluids may react to light between 450 and 455 nm wavelengths, while wearing the appropriate filter glasses or goggles. The reaction may either appear as a light stain against a dark background, or in some circumstances, the stain appears darker against a light background. The reaction must be interpreted with caution since other substances (such as, but not limited to, urine, semen, makeup, yogurt, cleaners, bleach alternatives, etc.) may also react to an ALS. Samples exhibiting a reaction to an ALS require further examination to indicate the presence of saliva.

1.2.1.4 References

The Use of Polilight in the Detection of Seminal Fluid, Saliva, and Bloodstains and Comparison with Conventional Chemical-Based Screening Tests, Vandenberg et al, Journal of Forensic Science Vol. 51 #2, March 2006

Virginia Division of Forensic Science, Forensic Biology Procedure Manual (Book 2 of 2), Case Approach and Identification of Biological Substances: Other Biological Samples, Effective Date 3-14-06, p 6 of 9.

Foster+Freeman Crime-Lite® 82S: Powerful Alternate Light Sources for Crime Scene and Laboratory

1.2.2 Independent Forensics Rapid Stain Identification of Human Saliva - Immunological Test

1.2.2.1

The Rapid Stain Identification Test for saliva is a lateral flow immunochromatographic strip test designed to detect the presence of human salivary α-amylase. This test detects the presence of salivary amylase, rather than the activity of the enzyme. Amylase is an enzyme found in high concentration in human saliva, but can also be found in other body fluids. Therefore, it is used to indicate the presence of saliva.

Caution: Positive results have been obtained with human breast milk, human feces and dog feces.

1.2.2.2 Materials

Rapid Stain Identification of Human Saliva kit from Independent Forensics

1.2.2.3 Controls

Positive and negative controls shall be used for function verification. These will be run prior to the use of the kit lot. Future shipments of the same lot number will still need controls run for function verification to account for potential differences in shipping conditions. The positive control shall be a known saliva sample. The lot number, control results, and the QA/QC date shall be documented in STACS-CW.

1.2.2.4 Procedure

Remove a portion of the suspected stain and place in an extraction tube.

Add 400µl of RSID® Saliva Universal Buffer or deionized water.

Vigorously vortex the sample and incubate for 10 minutes at room temperature.

Note: An aged saliva stain may require a longer extraction time of 2 hours to overnight.

Remove the portion of the substrate and place into the basket portion of the extraction tube. Place the basket into the extraction tube.

Centrifuge the extraction tube at high speed for approximately 3 minutes.

Transfer 20µl of supernatant to a new tube. Add 80µl of RSID® Saliva Universal Buffer for a total volume of 100µl.

Note: The remaining extract may be utilized for DNA testing.

Load all 100 µl into the sample well ("S" area) on the test cassette.
Start a timer for 10 minutes and read the results at 10 minutes.

1.2.2.5 Results and Interpretation

Positive reaction: If there are two red lines, one each in the test area 'T' and in the control Area 'C'.
Negative reaction: If there is only one red line in the control area 'C',
Invalid reaction: If there is no red line at the control area 'C'. (The test should be repeated if determined to be invalid.)
Inconclusive reaction: If there is a gray line (line observed but no red color, commonly referred to as a “shadow band” or “ghost band”) in the test area “T” and a red line in the control area “C”. If a shadow band is obtained, the sample should be re-run. It may also be necessary to re-extract the sample and re-run the test. If the shadow band is repeated on a subsequent test attempt(s), the test result is inconclusive.

1.2.2.6 References

Independent Forensics Rapid Stain Identification of Human Saliva (RSID® Saliva) Technical Information Sheet

Michigan State Police Internal Validation, 2019.