

The Role of Cheiloscopy in Forensic Science

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Abstract

Cheiloscopy is the study of lip prints, which are the unique patterns and lines that are found on the lips. In forensic science, lip prints can be used to identify individuals and to provide evidence in criminal investigations. Lip prints can be left on various surfaces, such as cups, glasses, and cigarettes. They can be collected from these surfaces and compared to known lip prints in order to identify the individual who left them. Lip prints can be analyzed for characteristics such as shape, pattern, and ridge count, which can be used to distinguish one individual from another.

While lip prints are not as commonly used as fingerprints in forensic science, they can be a valuable piece of evidence in certain cases. They can be particularly useful in cases where there are no other means of identification, such as in cases of unidentified remains. In these cases, lip prints can be used to help identify the individual and potentially provide clues about their identity and circumstances of their death. As handwriting and Fingerprints, Lip prints also support the principle of Uniqueness/Individuality which state that two things can be similar but cannot be alike. Lip prints start to develop at 6th week of intrauterine period. Lip print is basically a pattern of Wrinkles and Fissures on the labial mucosa and the study of lip prints is referred to as cheiloscopy. Lip prints can help to determine the gender, race etc. Lip prints can be found in the cases of burglary, Sexual assault etc. which could be found useful in determining the perpetrator.

Overall, the use of lip prints in forensic science can help to identify individuals and provide evidence in criminal investigations

Keywords: Cheiloscopy; Lip prints; Sexual assault; Uniqueness; labial mucosa; etc.

Introduction

Lips are actually composed of three layers: the skin (epidermis), the connective tissue (dermis), and the muscle (hypodermis). The skin of the lips is thin and delicate, and it is continuously exposed to the environment, so it is important to keep the lips moisturized to prevent dryness and cracking. The connective tissue layer contains blood vessels, nerves, and sweat glands, which help to regulate temperature and provide sensation to the lips. The muscle layer helps the lips to move and form expressions.

Lips are composed of epidermis, Connective tissues and muscle layer. They are formed in the sixth week of intrauterine life. The reddish skin that covers the edges of the borders of the lips called vermilion borders. These are the patterns made of grooves and fissures. They remain the same throughout the life but may change with any injury, deformity or disease. They play an important role in forensic Science and are found to be of equal evidentiary value as that of fingerprints.

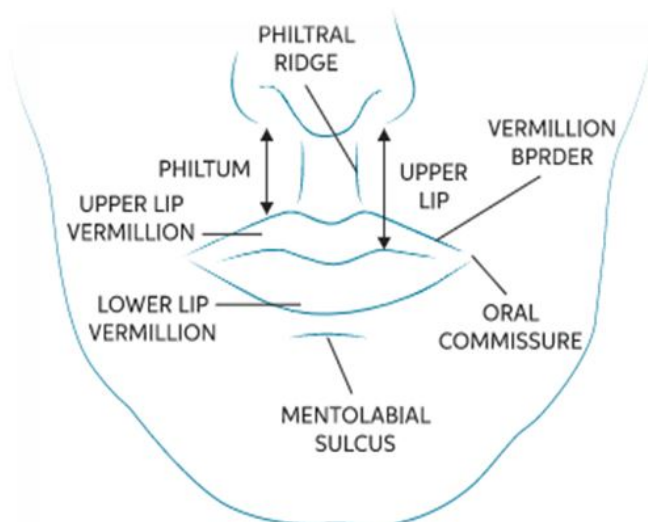


Figure 1

History

In 1902, Fischer was the first to describe the pattern of furrows on the red part of the lips. Late, In 1932 Edmond locard use lip prints in criminalization and identification of a person. In 1967, Suzuki made a detailed study on features of lip print and extracted the features that could be used in forensics.

Classification

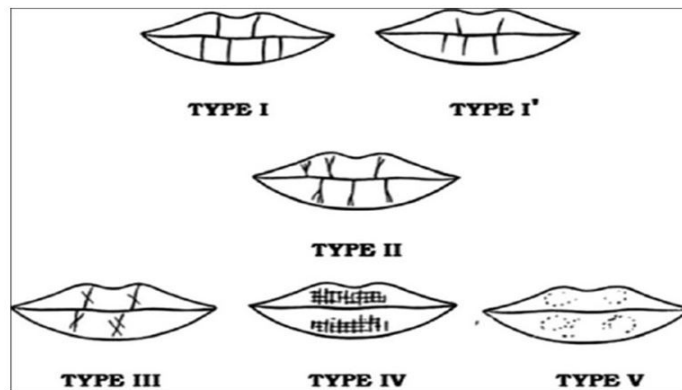
The first person to classify lip patterns was Santos, in 1967. He Classified lip prints into 4 types

1. Straight line
2. Curved line
3. Angled line
4. Sine shaped curve

The second classification was given by Suzuki and Tsuchihashi in 1970. They classified lip prints into 6 Types.

Table 1: Second classification

S.No.	Type of Classification	Description
1	Type I	A clear-cut groove running vertically across the lip.
2	Type I'	Partial-length groove of Type I.
3	Type II	A Branched groove.
4	Type III	An intersected groove.
5	Type IV	A Reticular pattern
6	Type V	Other patterns.

**Figure 2:** Second classification of lip prints

Documentation of Lip Prints

1. Lip Prints can be documented in a no. of ways which are as follows:
2. **Photography:** Lip prints of the suspect are photographed directly. Lips prints present on non porous surface can be photographed, enlarged and overlaid.
3. **Sample:** Samples of lip prints can be collected by applying lipstick on the sampler's lips and instructing to press lips against paper.
4. **By Brushing:** Magnetic powders are brushed over the lips and then the person is supposed to press lips against the porous/non porous surface
5. Latent lip prints can be developed in a number of ways which are described as follows.

Development of Latent Lip Prints

The procedure to develop latent lip prints is similar to that the latent fingerprints.

a) On Porous Surfaces: These are the material mostly adsorbent. Therefore late prints can be developed by fuming of cyanoacrylate, use of fluorescent dyes such as Nile red, use of DFO on multicolored or dark surfaces, Since lips does not possess sweat glands, ninhydrin proves to be in effective. It is very challenging to develop lip prints on the porous surfaces such as paper, tissue, cloth, word etc.

b) On Non-Porous surfaces: The surface which does not possess the property of absorbance are called non porous surfaces. This includes rubber, painted wood, glass etc. Fluorescent powders are used for their development such as silver metallic powder, cobalt oxide, fluorescent/Lysochromes dyes, Aluminum powder, and plumb carbonated powder.

Lip prints can be found in the cases of Burglary, rape cases, Murders. They can be seen on crockery, windows, doors, paintings, cigarettes ends etc. Side by side of tooth prints on food items, lip prints can also be there. Lip Prints help to link the crime with suspect and helps to save the innocent and provide justice to the victim.

Lip Prints in the Court of Law

In the literature lip prints prove to be a positive identification and it is generally accepted by the forensic community. Like fingerprints, they are also considered to be transferable evidence. Lip print remains same throughout the life despite any injury or disease.

Recommendation

The lip prints can be used as a reliable aid to human identification in the field of forensic science.

However, further studies should be conducted on a large number of individuals of different races, family members, twins, and siblings and for gender determination. In addition, a standard and uniform procedure needs to be put forth for the collection, the development, recording, and computerized analysis of the lip prints.

Discussion

Lip prints bring added evidence to a crime scene that can be valuable, especially in cases lacking other evidence, like fingerprints. Lip prints can be a factor in many different kinds of crimes, such as tape when a person has been bound or gagged, prints on a glass that a person drank from, prints on a cigarette butt, and prints on a glass/window if they were pressed up against it. All of these are potential places where lip prints may be found and used in the investigation of a crime, the identification of latent print evidence is often considered the key in solving a crime.

However, the use of lip prints in criminal cases is limited because the credibility of lip prints has not been firmly established in the court system.

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