

LIP PRINTS: THE UNDERESTIMATED IDENTIFIERS IN THE COMBAT AGAINST CRIME

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1 INTRODUCTION

Crime is prevalent in our modern society and there does not appear to be an escape from it. It is not restricted to particular sections of the world, but occurs all over the globe. Through the years, excellent progress has been made in crime-combating methodologies and technologies; yet, there does not seem to be an ideal deterrent to crime. It is therefore paramount that the criminal justice system is equipped with the best possible tools to accurately identify and bring offenders to justice. A method that has crystallised in the accurate identification of offenders is the use of fingerprint evidence.¹

Fingerprints are well known for their high probative value. Every human being possesses unique fingerprints² and, for that reason, can be associated with such prints to a high degree of certainty when they are found on a particular object and/or surface.³ There exist various databases that store records of fingerprints for the purposes of comparison in criminal or other investigations.⁴

However, what happens when no fingerprints are available in a particular situation, but there is another type of print, like a lip print? Can a positive identification be made from a lip print? Is there a database of lip prints that

¹ In this regard, see The Editors of Encyclopaedia Britannica "Dactyloscopy: Fingerprint Identification" <https://www.britannica.com/topic/dactyloscopy> (accessed 2018-11-21). Dactyloscopy refers to "[t]he analysis and classification of patterns observed in individual prints".

² Kannan, Muthu, Muthusamy and Sidhu "Cheiloscopy: A Vital Tool in Crime Investigations" 2015 3(3) *International Journal of Forensic Science and Pathology* 92; Dineshshankar, Ganapathi, Yoithappunath, Maheswaran, Kumar and Aravindhan "Lip Prints: Role in Forensic Odontology" 2013 5(1) *Journal of Pharmacy and Bioallied Sciences* 595; Bellengere, Palmer, Theophilopoulos, Whitcher, Roberts, Melville, Picarra, Illsley, Nkutha, Naude, Van der Merwe and Reddy *The Law of Evidence in South Africa: Basic Principles* (2016) 333.

³ Prabhu, Dinkar, Prabhu and Rao "Cheiloscopy: Revisited" 2012 4(1) *Journal of Forensic Dental Sciences* 47; Schwikkard, Van der Merwe, Collier, De Vos, Skeen and Van der Berg *Principles of Evidence* 2ed (2002) 368.

⁴ Heading 6.

can be accessed for the purpose of comparisons? What is the probative value of a lip print? These are important questions because, in cases of murder, rape and burglary, lip prints (sometimes accompanied by tooth marks) may be present at the crime scene or on the clothes or body of a victim.⁵

In this article, the probative value of lip prints, classified as body-prints, is examined and evaluated. This is a necessary examination, as lip-print evidence has not been used much in the court system.⁶ Cheiloscopy, a forensic investigative technique, is also discussed. This technique concerns the identification of a human being from his or her lip traces.⁷ Lip prints are also compared to fingerprints in order to determine their probative value. The question is whether there should be a database of lip prints in order to facilitate the identification of suspects in cases where no fingerprints, other body-prints or any other identifying features are present and possible. Furthermore, this article also investigates whether DNA extraction is possible from lip prints; if possible, this would have a profound influence on the success rate of the criminal justice system in identifying offenders and bringing them to justice.

In this article, reference to the masculine gender refers also to the feminine gender, and *vice versa*.

2 LIP PRINTS

2.1 Definition and background

A lip print can be defined as the impression or imprint that the lips of a person leave on a particular surface – for example, a napkin, drinking glass or cup, or even on a glass door.⁸ The imprint stems from the wrinkles and grooves on the lips – more specifically, the labial mucosa.⁹ This refers to the red part of the lips.¹⁰ These wrinkles and grooves were noted in 1902 by Fischer, an anthropologist.¹¹ In 1932, Locard recommended that lip prints

⁵ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 3.

⁶ *People v Davis* Case No. 2-97-0725 <https://law.justia.com/cases/illinois/court-of-appeals-second-appellate-district/1999/2970725.html> (accessed 2018-11-29).

⁷ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595; Sharma, Sharma, Wadhawan and Aggarwal "Can Lip Prints Provide Biologic Evidence?" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/> (accessed 2018-12-05); El-Ghamry, Abdullatif and Ismail "Duration of Reliability of Lip Print as Physical Evidence at Scene of a Crime" 2014 8(1) *International Research Journal of Applied and Basic Sciences* 26; Sharma, Gupta, Vij, Sharma, Tyagi and Singh "Cheiloscopy: A Tool for Antemortem Identification" 2017 9 *Indian Journal of Dental Sciences* 176. The word "cheiloscopy" stems from the Greek words "cheilos" and "e skopein", which means "lips" and "to see" respectively.

⁸ Kannan *et al* 2015 *IJFP* 89; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48; El-Ghamry *et al* 2014 *IRJABS* 26.

⁹ Sharma, Saxena and Rathod "Cheiloscopy: The Study of Lip Prints in Sex Identification" 2009 1(1) *Journal of Forensic Dental Sciences* 24; Dineshshankar *et al* 2013 *J. Forensic Dent. Sci.* 595. The labial mucosa is also referred to as the *sulci labiorum*.

¹⁰ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595; Kannan *et al* 2015 *IJFP* 1.

¹¹ Kannan *et al* 2015 *IJFP* 89.

should be employed in crime-scene investigations.¹² Just like fingerprints, these wrinkles and grooves form patterns that can indicate whether a human being has been present at a particular crime scene. In this way, a human being could be identified if such lip prints could be linked to a particular person.¹³ Imprints are valuable sources of impression evidence, as they can identify an offender with a high degree of certainty.¹⁴ It therefore comes as no surprise that Snyder, a forensic expert who was referred to as “the father of cheiloscopy”, stated in 1950 that lip prints have the same unique features as thumb prints and that they should therefore be used to identify people.¹⁵

Lip-print evidence, as a type of imprint evidence, therefore indicates individual characteristics of a particular person,¹⁶ in the same way that fingerprint evidence does.¹⁷ It is unique and does not change.¹⁸ A study by Maheswari and Gnanasundaram confirmed that lip prints do not change at any stage of a person’s life.¹⁹ Age, familial or genetic similarities between parents and children, and sex do not determine the peculiarity of lip prints in any way.²⁰ It is regarded as real evidence, just like fingerprint evidence, in that the original lip print, or a photograph thereof, must be presented to the court for consideration.²¹

An impression is made when lips make contact with the surface of an object²² and transfer the pattern, made up by the wrinkles and grooves, onto the object. It is this pattern that results in lip prints being as unique as fingerprints.²³ An investigation, conducted in 1972 by McDonell, indicated that even identical twins have different lip prints.²⁴ A more detailed discussion about the various lip-print patterns is conducted later in this

¹² *Ibid.*

¹³ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>; Encyclopaedia Britannica <https://www.britannica.com/topic/dactyloscopy>; El-Ghamry *et al* 2014 *IRJABS* 26.

¹⁴ Zinn and Dintwe (eds) *Forensic Investigation: Legislative Principles and Investigative Practice* (2015) 132.

¹⁵ These statements are contained in Snyder’s book, *Homicide Investigation*. Also see Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597 in this regard, where it is stated: “[l]ip prints have the same value as dactyloscopic traces. In the case of traces, in the shape of strains the identification examination terminates with group identification; in their character they are similar to other chemical and biological traces.”

¹⁶ Zinn and Dintwe (eds) *Forensic Investigation* 132 in this regard.

¹⁷ Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

¹⁸ *Ibid.*; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

¹⁹ El-Ghamry *et al* 2014 *IRJABS* 26; Sharma *et al* 2017 *Indian J. Dent. Sci.* 176.

²⁰ *Ibid.*

²¹ Schmidt *Bewysreg* 3ed (1993) 306–307 with regard to the position applicable to fingerprint evidence.

²² *Ibid.*

²³ Zinn and Dintwe (eds) *Forensic Investigation* 132; Kannan *et al* 2015 *IJFP* 92; Prabhu *et al* 2012 *J. Forensic Dent. Sci* 47; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595 and Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/> with regard to the uniqueness of fingerprints.

²⁴ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Kannan *et al* 2015 *IJFP* 89. Japanese scientists Tschishashi and Suzuki concluded that lip prints even on uniovular twins are not the same.

article.²⁵ Just like fingerprints, lip prints can therefore be a reliable source from which to identify an offender, a finding that cannot easily be disputed in a court of law.²⁶ Lip-print evidence may even be the decisive probative material in a case where no other evidence is available.²⁷ A hypothetical case study of a bank robbery may serve as an example. Imagine a man disguised as a woman, complete with a wig, dress and lipstick. He robs a bank and, on his way to exit the bank, he hits his face against the glass entrance doors. After his escape from the crime scene, his lip prints are lifted from the glass doors. At a later stage, the police receive information about his whereabouts and are able to compare lip prints found on the glass door with his lips. They are a perfect match. In a case like this, lip-print evidence would prove to be significant in identifying an offender with reasonable precision.²⁸

It is submitted that lip prints should be treated as body-prints for purposes of the Criminal Law (Forensic Procedures) Amendment Act.²⁹ The Act describes body-prints as “[p]rints other than fingerprints, taken from a person and which are related to a crime scene, but excludes prints of the genitalia, buttocks or breasts of a person”.³⁰ The significance of this definition is discussed elsewhere in this article.³¹

2.2 The classification and composition of lip prints

In 1902, an anthropologist, Fischer, noted a system of furrows on the red part of the lips of a human being and started to describe it.³² Locard, a French criminologist, recommended in 1932 that lip prints be used for the identification of humans.³³ It was Snyder, in 1956, who suggested that lip prints should be used in an actual case for purposes of identification.³⁴

Classification of lip prints had been suggested in 1960 by Santos.³⁵ Lip grooves had however been classified for the first time in 1967 by Santos.³⁶ He identified four types of groove – namely, straight lines, curved lines, angled lines, and sine-shaped lines.³⁷ In 1970, scientists Suzuki and Tsuchihashi developed a classification of various lip prints, including: clear-

²⁵ Heading 2.2.

²⁶ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Zinn and Dintwe (eds) *Forensic Investigation* 132.

²⁷ Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

²⁸ Sharma *et al* 2017 *Indian J. Dent. Sci.* 178.

²⁹ 6 of 2010. This Act came into operation during January 2013.

³⁰ S 2; Bellengere *et al* *The Law of Evidence* 333.

³¹ Heading 4.

³² Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595; Sharma *et al* 2009 *J. Forensic Dent. Sci.* 24.

³³ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Sharma *et al* 2009 *J. Forensic Dent. Sci.* 24.

³⁴ *Ibid.*

³⁵ Kannan *et al* 2015 *IJFP* 89.

³⁶ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Kannan *et al* 2015 *IJFP* 90.

³⁷ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Kannan *et al* 2015 *IJFP* 90; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49; El-Ghamry *et al* 2014 *IRJABS* 26.

cut grooves, running vertically across the lips; partial-length grooves running vertically across the lips; branched grooves; intersected grooves; reticular patterns; and other patterns, not forming part of any of the aforementioned print patterns.³⁸ These patterns can be viewed in Annexure A to this article.³⁹

A French scientist, Renaud, classified lip prints as follows: complete vertical, incomplete vertical, complete bifurcated, incomplete bifurcated, incomplete intersecting, reticular, sword-like, horizontal and other types of patterns.⁴⁰

Afchar-Bayat classified lip prints to include: vertical and straight grooves that cover the entire lip; vertical and straight grooves that do not cover the entire lip; straight-branched grooves; angulated branched grooves; converging grooves; reticular-shaped grooves; and other grooves.⁴¹ Kasprzak's classification is more extensive, comprising 23 types of lip-print shape, being the following:⁴²

- a) eye;
- b) hook;
- c) bridge;
- d) line;
- e) dot;
- f) rectangle;
- g) triangle;
- h) group of dots;
- i) top furcation;
- j) bottom furcation;
- k) double eye;
- l) hexagonal arrangement;
- m) crossing lines;
- n) closing bottoms furcation;
- o) delta-like opening;
- p) simple opening;
- q) closing top bifurcation;
- r) pentagonal arrangement;
- s) branch-like top furcation;
- t) star-like bifurcation;
- u) fence;
- v) branch-like bottom bifurcation; and
- w) double fence.

³⁸ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596; Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>; Kannan *et al* 2015 *IJFP* 89, 90; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49; El-Ghamry *et al* 2014 *IRJABS* 26.

³⁹ The sketch, provided in the Annexure, is from Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596.

⁴⁰ Kannan *et al* 2015 *IJFP* 90; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49.

⁴¹ Kannan *et al* 2015 *IJFP* 90, 91.

⁴² Kannan *et al* 2015 *IJFP* 90, 91; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 50.

These patterns can be viewed in Annexure B to this article.⁴³

Apart from grooves and wrinkles, lip anatomy and thickness can also be analysed by way of cheiloscopy.⁴⁴ Such classification was also done by Santos.⁴⁵ This can be significant in determining whether an offender belongs to a particular race, which can further narrow down potential suspects in an investigation. The classification is as follows:⁴⁶

- a) thin lips, mostly found in European Caucasians;
- b) medium lips, the most common type of lips;
- c) thick to very thick lips, mostly found in Black people; and
- d) lips of mixed size, usually found in Orientals.

The classification by Suzuki and Tsuchihashi is the most commonly used classification when recording lip-print patterns.⁴⁷

Williams observed that, in many instances, it is not possible to distinguish individual lip prints, in a particular set, from one another.⁴⁸ The reason for this can be ascribed to the flexibility of the lips, amount of transfer medium, lip movement during recording of lip-print impressions, lip pressure during recording of lip-print impressions, as well as the position of the lips at the time of recording.⁴⁹ El-Ghamry found a way to circumvent this problem: he noted that there are primary lines that are present on the lips of all persons, as well as secondary lines that are present in the lips of some but not of others.⁵⁰ He consequently classified the lines as such.⁵¹ The significance of this classification lies in the fact that some lines appear in the lip prints of all persons (primary lines) while other lines (secondary lines) only appear in the lips of some persons, but not others.⁵² Using this classification, individual lip prints could be distinguished from one other more easily.

Apart from grooves and wrinkles that can serve as identifying human features, as explained, lip-print evidence can also contain biological trace evidence – for example, saliva and blood.⁵³ DNA can therefore be obtained from a lip print. However, this process has not yet been employed.⁵⁴ It should, however, be possible to ascertain the sex of a person, cosmetics used, habits, occupational traits and pathological changes to lips from lip-print evidence.⁵⁵

⁴³ The sketch, provided in the Annexure, is from Kannan *et al* 2015 *IJFP* 91.

⁴⁴ Kannan *et al* 2015 *IJFP* 90.

⁴⁵ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49.

⁴⁶ Kannan *et al* 2015 *IJFP* 90, 91; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49.

⁴⁷ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49.

⁴⁸ El-Ghamry *et al* 2014 *IRJABS* 26.

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² *Ibid.*

⁵³ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48; Kannan *et al* 2015 *IJFP* 92.

⁵⁴ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48.

⁵⁵ *Ibid.*

2.3 Collecting lip-print evidence from a crime scene

As an apt introduction to this discussion, the bank-robbery scenario, mentioned earlier,⁵⁶ is useful. When the robber's face hit the glass doors of the bank, his lips, covered with lipstick, came into contact with the surface of the glass doors and consequently left an impression. This impression is then used for analysis and extracting available evidence. However, not all lip prints are easy to detect. Nowadays, many cosmetics manufacturers produce smudge-free lipsticks, the so-called persistent lipsticks, which can make lip prints difficult to detect.⁵⁷ This does not mean that these hidden or latent lip-print impressions can never be detected. There are methods by which to detect and obtain such latent lip prints for purposes of analysis.⁵⁸

But how exactly is the impression created and, thereafter, obtained for analysis? There are minor salivary glands, sebaceous glands and sweat glands in the vermilion borders of the lips.⁵⁹ Vermilion borders of the lips refer to:

“[t]he red margin of the upper and lower lips, which commence at the exterior edge of the intraoral labial mucosa ('moist line') and extends outward, terminating at the extraoral cutaneous junction, a thinly keratinized type of stratified squamous epithelium deeply penetrated by well-vascularized dermal papillae that show through the translucent epidermis to impart the typical red appearance of the lips.”⁶⁰

Secretions from these glands, or dermal papillae as referred to in the mentioned definition, are transferred from the ridges of the lips onto the applicable surface.⁶¹ In this way, perspiration, oil and even blood may be transferred onto a surface.⁶² The appearance of lip-print impressions may vary, however, depending on the pressure of the lips against a surface, the direction in which the lips were pointing when the impression was made, as well as the method by which the impression was made.⁶³ As in the above-mentioned scenario, lips may be covered in lipstick, which is common worldwide, especially in the case of female persons. However, lipstick does not complicate the transfer process as it sticks to the surface in the same way that biological secretions do,⁶⁴ provided that it is not a persistent lipstick – namely, a lipstick that does not leave a smear or visible mark after contact with a particular surface.⁶⁵ After the lip-print impression has been identified

⁵⁶ Heading 2.1.

⁵⁷ Kannan *et al* 2015 *IJFP* 92.

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*

⁶⁰ *Medical Dictionary for the Health Professions and Nursing*. S.v. "vermilion border" <https://medical-dictionary.thefreedictionary.com/vermilion+border> (accessed 2018-11-29).

⁶¹ Kannan *et al* 2015 *IJFP* 92.

⁶² *Ibid.*

⁶³ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595.

⁶⁴ Kannan *et al* 2015 *IJFP* 92; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 3.

⁶⁵ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48–49. The difficulty in dealing with persistent lipsticks is discussed elsewhere in this article – see heading 2.5.

on a surface, it is photographed.⁶⁶ The photographs can be enlarged in order to make the grooves and wrinkles on the prints more visible.⁶⁷

However, the process is not always that simple. There are crime scenes where lip prints may be latent and hard to detect. In such instances, special detection methods must be employed in order to make the latent lip-print impressions more visible. These detection methods differ, depending on the particular surface that is examined for lip-print evidence.⁶⁸ Conventional non-magnetic⁶⁹ red, white, black and/or silver metallic fingerprint powder can be used to detect latent lip prints.⁷⁰ The lip prints must, however, be dry for the powder to be effective.⁷¹ Cyanoacrylate,⁷² ninhydrin⁷³ and lysochrome can also be used to detect latent lip prints.⁷⁴ Lysochrome is a soluble dye that is used in the histochemical staining⁷⁵ of *inter alia* fatty acids.⁷⁶ It is especially efficient in detecting lip prints as it is quite sensitive to the oil that is secreted by the lips.⁷⁷ It is recommended that use should be made of fluorescent dyes where the colour of the dye and the colour of the surface, which is examined for latent lip prints, is the same.⁷⁸ Nile red has also been suggested for use in developing latent lip prints.⁷⁹ It is a chemical that illuminates when applied to latent lip-print impressions, clearly showing the lip print.⁸⁰

⁶⁶ Kannan *et al* 2015 *IJFP* 92.

⁶⁷ *Ibid.*

⁶⁸ *Ibid.*

⁶⁹ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

⁷⁰ Kannan *et al* 2015 *IJFP* 92; Sharma *et al* 2009 *J. Forensic Dent. Sci.* 1; Sharma *et al* 2017 *Indian J. Dent. Sci* 176; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597. This powder works well on *inter alia* windows, counter-tops, televisions, metal file cabinets, painted doors and metal window frames.

⁷¹ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

⁷² Hotmelt.com "What Is Cyanoacrylate Glue?" <https://www.hotmelt.com/blogs/blog/what-is-cyanoacrylate-glue> (accessed 2018-11-20); Daane "Alloplastic Implantation" <https://www.sciencedirect.com/topics/medicine-and-dentistry/cyanoacrylate> (accessed 2018-11-20). Cyanoacrylate is an adhesive and is generically used by households as instant glues, power glues or super glues. It can also have industrial or medical uses. In the medical field, it can be used as a hemostatic agent to glue tissue together when dealing with surgical wounds. Also Dineshshankar *et al* *J. Pharm. Bioallied Sci.* 596.

⁷³ Ninhydrin is a chemical that is employed to detect ammonia or amines. It reacts with amines and produces a deep blue or purple colour, called Ruhemann's purple.

⁷⁴ Kannan *et al* 2015 *IJFP* 92

⁷⁵ MicroscopeMaster "Histochemistry: Techniques/Methods, Staining and Tests" <https://www.microscopemaster.com/histochemistry.html> (accessed 2018-11-19). Histochemistry is a technique employed in order to detect and visualise biological structures. Histochemical staining, with regard to lip prints, therefore refers to chemicals that are applied in order to detect (latent) lip-print impressions.

⁷⁶ StainsFile "Lysochromes" <http://stainsfile.info/theory/lysochr.htm> (accessed 2018-11-20); Baker *Principles of Biological Microtechnique* (1958) 297–298; Kannan *et al* 2015 *IJFP* 92. Lysochrome is available in Sudan III, Sudan IV, oil red O and Sudan black.

⁷⁷ Kannan *et al* 2015 *IJFP* 92.

⁷⁸ *Ibid.*

⁷⁹ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49.

⁸⁰ ThermoFisher Scientific "Nile Red" <https://www.thermofisher.com/order/catalog/product/N1142> (accessed 2018-11-22) where Nile red is described as a chemical that is "[u]sed to localize and quantitate lipids, particularly neutral lipid droplets within cells. Nile red is almost nonfluorescent in water and other polar solvents but undergoes fluorescence enhancement and large absorption and emission blue shifts in nonpolar environments."

After detection of latent lip-print impressions, photographs of the impressions are taken and these are used for analysis.

The lip-print patterns on the photographs must obviously be compared to the lip-print impression of a suspect in order for the crime-scene investigators to make a comparison between the impression lifted from the crime scene and the impression obtained from a suspect. In order to obtain a lip print from a suspect, lipstick or another transfer medium is applied to the lips.⁸¹ The suspect is then required to press his lips against a sheet of paper or a piece of cellophane tape,⁸² from which a comparison lip-print impression is obtained. A lip-print impression from a suspect can also be obtained by requesting the suspect to press his lips against a particular surface, after which fingerprint powder or magnetic powder⁸³ is used in order to develop such lip-print impression. In this regard, it is not necessary that the suspect covers his lips with lipstick or another recording medium.⁸⁴ Such lip impressions should then be exposed to heat or be allowed to air dry before the magnetic powder is added.⁸⁵ It is also possible to use a fingerprint roller in order to obtain an impression of a suspect's lips.⁸⁶ However, the easiest way to obtain a lip-print sample from a suspect is to take a photograph of his lips.⁸⁷ The suspect can also be requested to press his lips against a flat, non-porous surface – for example, a mirror, in order to leave a lip-print impression. This impression can then be photographed and enlarged. Thereafter, overlay tracings of the wrinkles and grooves on the lips can be made on the enlargement.⁸⁸

The procedural aspects, as to the collection of lip prints, are discussed elsewhere.⁸⁹ However, it is worth mentioning at this stage that sections 37 and 225 of the Criminal Procedure Act⁹⁰ govern the collection of finger and body prints from a suspect or suspects.⁹¹ In terms of these provisions, these prints may be acquired from an accused person, even without his consent, and still be admissible as evidence in court in a matter against such an accused.⁹² The constitutionality of these provisions has come under scrutiny⁹³ on the grounds that these provisions constitute violations of the rights:

⁸¹ Kannan *et al* 2015 *IJFP* 92; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596.

⁸² *Ibid.*

⁸³ BVDA "Magnetic Powders" <http://www.bvda.com/en/magnetic-powders> (accessed 2018-11-20). A magna brush is used to apply magnetic powder to fingerprint impressions in order to clearly indicate such prints. The same approach can be followed as far as lip prints are concerned. Also see Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

⁸⁴ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596.

⁸⁵ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

⁸⁶ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596.

⁸⁷ *Ibid.*

⁸⁸ *Ibid.*

⁸⁹ Heading 4 2.

⁹⁰ 51 of 1977.

⁹¹ Bellengere *et al* *The Law of Evidence* 333.

⁹² Bellengere *et al* *The Law of Evidence* 333; ss 225(1) and (2) of the Criminal Procedure Act 51 of 1977.

⁹³ *S v Huma* 1995 (2) SACR 411 (W).

- a) not to be compelled to make a confession against oneself;⁹⁴
- b) to remain silent;⁹⁵
- c) not to give self-incriminating evidence;⁹⁶ and
- d) to privacy⁹⁷ and dignity⁹⁸ of a person.⁹⁹

Despite these challenges, the collection of body-prints from an accused person remains admissible.¹⁰⁰

2 4 Analysis of lip-print evidence

Successfully obtained lip-print evidence must be analysed in order for comparisons to be made. Analysis of both the obtained impression, as well as the lip-print sample from a suspect, must take place; otherwise, any comparison would be of no use. Suzuki and Tsuchihashi developed the following methodology in analysing lip-print evidence:¹⁰¹

- a) A horizontal line is drawn. This line symbolises the division between the upper and lower lips.
- b) A vertical line is drawn in the middle of the horizontal line, creating left and right sides.
- c) The lip-print classification method by these two scientists, as already discussed,¹⁰² is then used to record the grooves and wrinkles of the suspect.

⁹⁴ S 35(1)(c) of the Constitution of the Republic of South Africa, 1996 (the Constitution) provides: "Everyone who is arrested for allegedly committing an offence has the right ... not to be compelled to make any confession or admission that could be used in evidence against that person"; Bellengere *et al The Law of Evidence* 334.

⁹⁵ S 35(3)(h) of the Constitution provides: "Every accused person has a right to a fair trial, which includes the right ... to be presumed innocent, to remain silent, and not to testify during the proceedings"; Bellengere *et al The Law of Evidence* 334.

⁹⁶ S 35(3)(j) of the Constitution provides: "Every accused person has a right to a fair trial, which includes the right ... not to be compelled to give self-incriminating evidence"; Bellengere *et al The Law of Evidence* 334.

⁹⁷ S 14 of the Constitution provides: "[e]veryone has the right to privacy, which includes the right not to have—

- (a) their person or home searched;
- (b) their property searched;
- (c) their possessions seized; or
- (d) the privacy of their communications infringed."

⁹⁸ S 10 of the Constitution provides: "Everyone has inherent dignity and the right to have their dignity respected and protected."

⁹⁹ Bellengere *et al The Law of Evidence* 334; also see *Levack v Regional Magistrate, Wynberg* 2004 (5) SA 573 (SCA) and Council for Responsible Genetics <http://www.councilforresponsiblegenetics.org/dnadata/Countries/ZA.html> (accessed 2019-07-18) for a more comprehensive discussion in this regard.

¹⁰⁰ Bellengere *et al The Law of Evidence* 333. Also see *Levack v Regional Magistrate, Wynberg supra* and Council for Responsible Genetics "South Africa" <http://www.councilforresponsiblegenetics.org/dnadata/Countries/ZA.html> for a more comprehensive discussion in this regard.

¹⁰¹ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 51.

¹⁰² Heading 2 2.

- d) After the lip-print pattern has been recorded, the cheiloscopy expert can employ three technical methods to compare the two sets of lip prints:
- aa) the common-features method;
 - bb) the photographic-montage method; and
 - cc) the contour method.

These three technical comparison methods require brief explanation.

The common-features method is the most basic method of comparing lip prints.¹⁰³ This method entails determining the features that are common to both the print, lifted from the crime scene, and the lip print from the suspect, as well as identifying the individual features as listed by Kasprzak.¹⁰⁴

The photographic-montage method supplements the common-features method and entails a comparison between a photograph of the lip print taken at the crime scene, and a photograph of the lip print of the suspect.¹⁰⁵ The cheiloscopy expert looks for similarities between the two sets of prints.

The contours method also supplements the common-features method.¹⁰⁶ In terms of this method, contours of the most characteristic collection of lines on the red part of the lips of a suspect are impressed on transparent foil.¹⁰⁷ The collection of lines on the foil is then compared to the lines found on the lip-print impression on a photograph of the lip print found at the crime scene.¹⁰⁸

2.5 Potential problems with lip-print evidence

The aforementioned discussion is a definite indication of the invaluable role that lip-print evidence can play in the positive identification of offenders. Success obviously depends on the detection and acquisition of viable lip prints. If viable lip prints are not available, there might not be any reasonable prospect of apprehending a suspect in the absence of other evidence that can positively identify such a suspect. For this reason, it is important to discuss a few factors that may have an influence on the successful detection and acquisition of lip-print evidence at a crime scene.

It must be kept in mind that lip-print impressions are classified as real evidence.¹⁰⁹ Real evidence must be capable of being presented in court and analysed by witnesses and/or expert witnesses wherever necessary. For that reason, the court must be in position to observe such evidence in a clear manner to provide for certainty by which it may be guided. The problem with lip prints, as is the case with fingerprints, is that they can deteriorate over time and also disappear from a particular surface. The question can

¹⁰³ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 51.

¹⁰⁴ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 49. For a list of Kasprzak's features, refer to heading 2.2 above.

¹⁰⁵ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 51.

¹⁰⁶ *Ibid.*

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*

¹⁰⁹ Heading 2.1.

thus be asked: within which time frame must lip-print evidence be acquired from a crime scene?

A study by Osama, Abdullatif and Ismail into the longevity of lip prints yielded the following results:¹¹⁰

- a) on white paper, lip prints are reliable for up to 12 weeks;
- b) on glass, lip prints are reliable for up to 6 weeks if they are exposed to surrounding ambient conditions; and
- c) on glass, lip prints can be stable for up to 9 weeks, provided the glass is kept in a closed container and the temperature is adjusted to approximately 25 degrees Celsius.

The reason that lip-print impressions are more reliable on paper is that the grease of the impression is absorbed into the fine pores of the paper, while the same absorption does not happen in the case of a non-porous surface like glass.¹¹¹

It is safe to conclude therefore that resources or objects on which lip-print impressions are present should be stored with the utmost of care, and in suitable conditions, so as to preserve the lip-print impressions. As a further precaution in this regard, it is submitted that crime scenes, and especially items at crime scenes that may contain lip-print evidence, should be secured and examined as soon as possible so that the lip-print impressions can be acquired. This will prevent any possibility that prints may be wiped off, either by accident or on purpose – an eventuality that may have a profound effect on whether justice will prevail in a particular matter.

As already stated, the appearance of lip prints may vary according to the pressure used and direction in which the lips are pressed against a particular surface.¹¹² Although this will not influence the lip-print patterns produced, it may influence the size of the lip print.¹¹³ Therefore, where a crime-scene investigator finds a lip print that does not match the lip-print sample of a suspect in actual size, he should not assume that the suspect was not involved in the commission of the offence. He should rather conduct a proper examination of the lip-print patterns in order to see whether they match the lip-print patterns on the sample from the suspect.

The lips may also present certain abnormal conditions, including being chapped, inflamed, ulceric, infected or tumorous.¹¹⁴ A diseased state, or abnormal condition, of the lips is referred to as pathosis.¹¹⁵ These conditions may severely influence lip-print impressions, even to the extent that no impressions may be left on surfaces.¹¹⁶ It may also cause the production of lip prints that do not show all the patterns present under circumstances when

¹¹⁰ El-Ghamry *et al* 2014 *IRJABS* 28; Kannan *et al* 2015 *IJFP* 92.

¹¹¹ El-Ghamry *et al* 2014 *IRJABS* 28.

¹¹² Kannan *et al* 2015 *IJFP* 92.

¹¹³ *Ibid.*

¹¹⁴ *Ibid.*

¹¹⁵ Merriam-Webster "Medical Definition of Pathosis" <https://www.merriam-webster.com/medical/pathosis> (accessed 2018-11-26).

¹¹⁶ *Ibid.*

the lips are normal.¹¹⁷ In such cases, it may be difficult to obtain viable lip prints for analysis, and the focus should then rather move to other available evidence found at the crime scene.

As already mentioned, sometimes people wear lipstick that does not leave a smear on surfaces (so-called smudge-free or persistent lipsticks).¹¹⁸ The manufacture of this type of lipstick is the result of cosmetic companies giving the public what they want – lipsticks that do not stick to surfaces such as coffee cups, glasses and eating utensils.¹¹⁹ This may make it difficult to detect lip prints on particular surfaces at crime scenes. However, it does not mean that no lip-print impressions will be found in such circumstances. Crime-scene investigators should turn to examining the scene for latent lip prints, as mentioned before,¹²⁰ and not abandon their search for lip-print evidence.¹²¹

3 EXTRACTING BIOLOGICAL EVIDENCE FROM LIP PRINTS

The discussion thus far has indicated the importance of lip-print impressions, their unique construction and how they put crime-scene investigators in a position to identify offenders with a high degree of certainty. If, however, a viable lip print cannot be acquired, it may be that the incomplete or unclear lip print contains traces of biological fluids or substances that may facilitate the identification process. It is therefore worth examining the role that biological fluids and traces can play in this identification process.

The aforementioned bank-robbery scenario¹²² can again serve as a point of departure. The robber may simply have left a lipstick smear on the glass door, from which no viable lip print can be obtained. However, if the robber had a blister or sore on one of his lips that burst open as result of the impact with the glass door, it is possible that some blood mixed with the lipstick and remained on the glass door. If there is no blood, it may be that sufficient amounts of saliva mixed with the lipstick smear, or even that epithelial skin cells from the lips were shed and stuck to the lipstick smear.¹²³ These fluids and/or epithelials can now be analysed in order to facilitate the identification of the robber.

The significance of such analysis will be in the detection of DNA.¹²⁴ A person's blood group can be obtained using the ABO system;¹²⁵ in this way,

¹¹⁷ *Ibid.*

¹¹⁸ Heading 2 3.

¹¹⁹ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48.

¹²⁰ Heading 2 3; Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48.

¹²¹ Sharma *et al* 2009 *J. Forensic Dent. Sci.* 26. The fact that lip prints may be invisible, due to the presence of such lipstick on the lips, is insignificant. In this instance, lip prints can be lifted from surfaces by using aluminium powder and/or magnetic powder.

¹²² Heading 2 2.

¹²³ Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

¹²⁴ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48.

¹²⁵ The Editors of Encyclopaedia Britannica "ABO Blood Group System" <https://www.britannica.com/science/ABO-blood-group-system> (accessed 2018-11-26). The

the number of people involved in a particular crime scene can be determined, as well as their sex.¹²⁶ This method of obtaining and analysing DNA evidence, from lip prints, has however never before been used in a real-life case.¹²⁷ This is not strange as there are usually so many other types of evidence and traces available at crime scenes that investigators use to positively identify offenders. Nevertheless, this methodology should not be neglected. A study conducted to ascertain whether lip-print impressions can provide biological evidence¹²⁸ revealed that an ample amount of DNA can be extracted from a lip-print impression.¹²⁹ The presence of lipstick on the lips does not influence the isolation of any DNA that may be extracted from the impression.¹³⁰ Analysis of the DNA leads to determining the full “short tandem repeat loci”, commonly referred to as the STR loci,¹³¹ of the individual to whom the lip print, and evidently the DNA, belongs.¹³²

Consequently, items such as tissue paper, napkins, cups, glasses and eating utensils present at a crime scene should never be overlooked; DNA evidence on these items may supplement the presence of lip-print evidence, complete or incomplete. DNA may be found on lip-print impressions on porous and non-porous surfaces.¹³³ As stated earlier, lips containing swelling, lesions or any other pathosis can pose problems with regard to obtaining viable lip prints for identification.¹³⁴ However, pathosis of the lips does not complicate any DNA evidence that can be extracted from such lip prints, as degradation of lip-print patterns does not affect DNA profiling in any way. Chemicals used to detect and develop latent lip prints also do not result in the isolation of any DNA present on such prints.¹³⁵

However, the aforementioned study into extracting DNA from lip-print impressions is not without its limitations. The study was based on fresh lip-print impressions, left for a maximum of 24 hours.¹³⁶ The question thus arises as to what effect time will have on the viability of DNA present on such lip-print impressions. Pollution of the environment, more specifically of the crime scene, as well as poor conservation of the crime scene, more specifically of the lip-print impression, may affect whether crime-scene

ABO blood group system reflects the classification of human blood according to the inherited properties of red blood cells. The basic blood groups are A, B and O.

¹²⁶ *Ibid.*

¹²⁷ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 48.

¹²⁸ Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

¹²⁹ *Ibid.*

¹³⁰ *Ibid.*

¹³¹ Creative Bioarray “Cell Line Authentication” https://www.creative-bioarray.com/Services/Short-Tandem-Repeat-Analysis.htm?gclid=EAlalQobChMI16TX1_drx3glVVVoXVCh32Pg8-EAAYASAAEgKhGvD_BwE (accessed 2018-11-26). The STR loci can be defined as follows: “The human genome is full of repeated DNA sequences which come in various sizes and are classified according to the length of the core repeat units, the number of contiguous repeat units, and/or the overall length of the repeat region. DNA regions with short repeat units (usually 2-6 bp in length) are called Short Tandem Repeats (STR).”

¹³² Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

¹³³ *Ibid.*

¹³⁴ Heading 2 5.

¹³⁵ Sharma *et al* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5210110/>.

¹³⁶ *Ibid.*

investigators have anything to detect or analyse.¹³⁷ Fingerprint powder can still yield effective results 30 days after a fingerprint has been exposed to environmental conditions without any protection.¹³⁸ However, it should not be assumed that this is applicable to lip prints, or DNA associated therewith. A detailed discussion about the effect of environmental conditions on DNA evidence is outside the ambit of this article.

4 PROCEDURAL ASPECTS RELATING TO LIP-PRINT EVIDENCE

4.1 General

As already stated, lip prints, like fingerprints, are unique.¹³⁹ Fingerprint evidence is admissible and of invaluable probative value in criminal matters, as it can identify a person with a high degree of certainty.¹⁴⁰ The same applies to body-prints.¹⁴¹ Body-prints have already been defined elsewhere in this article.¹⁴² It is submitted that a lip print qualifies as a body-print, as it can be “taken from a person” and can “relate to a crime scene”.¹⁴³ It is furthermore submitted that lip prints should be treated in the same way as fingerprints as far as their collection and admissibility is concerned. The discussion that follows substantiates this submission.

For evidence to be admissible, it must not only be relevant to an issue in legal proceedings,¹⁴⁴ but also be obtained in a way that is not contrary to the law.¹⁴⁵ If evidence has been obtained improperly, unfairly, illegally or in violation of a constitutional right in the Bill of Rights,¹⁴⁶ such evidence may be found to be inadmissible. It is therefore important to determine whether lip-print evidence has been obtained in a proper way from a suspect. Some provisions of the Criminal Procedure Act¹⁴⁷ and the South African Police Service Act¹⁴⁸ are of significance in this regard.

4.2 Criminal Procedure Act¹⁴⁹

The following aspects, reflected in provisions of the Criminal Procedure Act, as amended by the Criminal Law (Forensic Procedures) Amendment Act,¹⁵⁰ must be noted when dealing with the collection of lip-print evidence:

¹³⁷ *Ibid.*

¹³⁸ *Ibid.*

¹³⁹ Heading 2.1.

¹⁴⁰ Bellengere *et al The Law of Evidence* 333.

¹⁴¹ *Ibid.*

¹⁴² Heading 2.1.

¹⁴³ S 36A(1)(c) of the Criminal Procedure Act 51 of 1977.

¹⁴⁴ Bellengere *et al The Law of Evidence* 25.

¹⁴⁵ Bellengere *et al The Law of Evidence* 234.

¹⁴⁶ Ss 7–39 of the Constitution of the Republic of South Africa, 1996.

¹⁴⁷ 51 of 1977.

¹⁴⁸ 68 of 1995.

¹⁴⁹ 51 of 1977.

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- a) The definition of body-prints,¹⁵¹ as already discussed elsewhere in this article,¹⁵² is important.
 - b) A police official may take the body-prints of any person arrested on a charge, or may cause such prints to be taken.¹⁵³
 - c) A police official may take steps that he or she deems necessary in order to determine whether or not the body of a person, arrested on a charge, contains any mark, characteristic or distinguishing features.¹⁵⁴ A police officer may thus examine a suspect to ascertain whether, for example, his lips show any pathosis, marks, or traces of lipstick. This is important when a lip print that does not show clear patterns, or a lipstick smear, is found at the scene of a crime. If the suspect is female, she must be examined by a female police officer, and a male officer must conduct the examination if the suspect is male.¹⁵⁵
 - d) A police official may take a photograph of the arrested person.¹⁵⁶ In the context of lip-print evidence, a photograph of the suspect's lips can later be compared with a lip-print impression collected at the crime scene. The police official may also task a medical officer of a prison, or a registered medical practitioner or registered nurse, to determine whether the body of a person, arrested on a charge, contains marks, characteristics or distinguishing features.¹⁵⁷
 - e) If a police official is not empowered to take body-prints from suspects or to determine whether the body of a suspect contains any distinguishing marks or features, a court, before which criminal proceedings are pending, may order such prints to be taken or features be determined from an accused involved in such proceedings.¹⁵⁸
 - f) Whenever evidence about the body-prints of an accused, as well as evidence that the body of the accused contains distinguishing marks or features, is relevant at court proceedings, such evidence shall be admissible at such court proceedings.¹⁵⁹ Such evidence will not be inadmissible because it was taken in contravention of the aforementioned principles, or against the will of the accused.¹⁶⁰ However, the evidentiary weight of such evidence may be affected.

Evidence of lip prints may be adduced as evidence in court by way of affidavit from an expert witness. In this regard, section 212(4)(a) of the Criminal Procedure Act¹⁶¹ states:

¹⁵⁰ 6 of 2010.

¹⁵¹ S 36A(1)(c) of 51 of 1977.

¹⁵² Heading 2 1.

¹⁵³ S 37(1)(a)(i) of 51 of 1977.

¹⁵⁴ S 37(1)(c) of 51 of 1977.

¹⁵⁵ S 37(1)(c)(ii) of 51 of 1977.

¹⁵⁶ S 37(1)(d) of 51 of 1977.

¹⁵⁷ S 37(2)(a) of 51 of 1977.

¹⁵⁸ S 37(3)(a) of 51 of 1977.

¹⁵⁹ S 225(1) of 51 of 1977.

¹⁶⁰ S 225(2) of 51 of 1977; Bellengere *et al* *The Law of Evidence* 333.

¹⁶¹ 51 of 1977.

“Whenever any fact established by any examination or process requiring any skill—

...
 (vi) ... in the identification of... body-prints ...,

is or may become relevant to the issue at criminal proceedings, a document purporting to be an affidavit made by a person who in that affidavit alleges that he or she is in the service of the State or of a provincial administration or any university in the Republic or any other body designated by the Minister for the purposes of this subsection by notice in the Gazette, and that he or she has established such fact by means of such an examination or process, shall, upon its mere production at such proceedings be *prima facie* proof of such fact.”

The expert witness may, however, be subjected to cross-examination, at which stage he or she must be present at the court proceedings in order to orally testify and be cross-examined by the accused or his legal representative.

The aforementioned position of the expert witness applies also to the investigating officer of a particular case. Section 212(6) of the Criminal Procedure Act¹⁶² provides:

“In criminal proceedings in which the finding of or action taken in connection with any particular ... body-print is relevant to the issue, a document purporting to be an affidavit made by a person who in that affidavit alleges that he or she is in the service of the State and that he or she in the performance of his or her official duties—

- (a) found such ... body-print at or in the place or on or in the article or in the position or circumstances stated in the affidavit; or
- (b) dealt with such ... body-print in the manner stated in the affidavit, shall, upon the mere production thereof at such proceedings, be *prima facie* proof that such ... body-print, was so found or, as the case may be, was so dealt with.”

This position furthermore also applies to the persons who are tasked with analysis of the lip-print impression. In this regard, section 212(8)(a) of the Criminal Procedure Act¹⁶³ provides:

“In criminal proceedings in which the receipt, custody, packing, marking, delivery or despatch of any ... body-print ... is relevant to the issue, a document purporting to be an affidavit made by a person who in that affidavit alleges—

- (i) that he or she is in the service of the State or of a provincial administration, any university in the Republic, or any body designated by the Minister ...;
- (ii) that he or she in the performance of his or her official duties—
 - (aa) received from any person, institute, State department or body specified in the affidavit, a ... body-print ... described in the affidavit, which was packed or marked or, as the case may be, which he or she packed or marked in the manner described in the affidavit;
 - (bb) delivered or despatched to any person, institute, State department or body specified in the affidavit, a ... body-print ... described in the

¹⁶² *Ibid.*

¹⁶³ *Ibid.*

affidavit, which was packed or marked or, as the case may be, which he or she packed or marked in the manner described in the affidavit;
 (cc) during a period specified in the affidavit, had a ... body-print ... described in the affidavit in his or her custody in the manner described in the affidavit, which was packed or marked in the manner described in the affidavit,
 shall, upon the mere production thereof at such proceedings, be *prima facie* proof of the matter so alleged.”

4 3 South African Police Service Act¹⁶⁴

The South African Police Service Act, as amended by the Criminal Law (Forensic Procedures) Amendment Act,¹⁶⁵ also provides some procedural guidelines that can be applicable to lip-print evidence. Chapter 5A of the Act is entitled “Storage and use of fingerprints, body-prints and photographic images of persons”. It provides that the National Commissioner of Police must ensure that, *inter alia*, body-prints are stored, maintained and administered, and are readily available, whether in computerised or other form.¹⁶⁶ Such storage and maintenance facilities are located within the division of the South African Police Service that is responsible for the handling of criminal records¹⁶⁷ – namely, the head office in Pretoria.¹⁶⁸ The practical effect of this provision is that there is a way to safeguard lip-print evidence that has been collected from a crime scene. Furthermore, this provision facilitates the maintenance of a lip-print database, which is discussed elsewhere in this article.

4 4 Presentation of lip-print evidence during court proceedings

Lip-print evidence cannot be presented to a court by a lay person. The reason is that the detection, obtaining and analysis of lip-print evidence is a specialised and scientific field for which training and expertise is required.¹⁶⁹ An expert witness must therefore present such evidence to a court. Fingerprint evidence, obtained from a crime scene, is sent to South African Police Service fingerprint evidence experts for analysis.¹⁷⁰ It is submitted that the same should happen in the case of lip-print evidence, based on the following:

¹⁶⁴ 68 of 1995.

¹⁶⁵ 6 of 2010.

¹⁶⁶ S 15A(1) of 68 of 1995, as amended by s 6 of 6 of 2010.

¹⁶⁷ *Ibid.*

¹⁶⁸ National Archives and Records of South Africa, Head Office http://www.archivalplatform.org/registry/entry/national_archives_and_records_service_of_south_africa_head_office/ (accessed 2018-11-29).

¹⁶⁹ See Zeffert and Paizes *The South African Law of Evidence* 3ed (2017) 347 in this regard as far as fingerprint evidence is concerned. As lip-print evidence is treated along the same lines as fingerprint evidence because of its uniqueness and specific patterns, it is submitted that this statement is *mutatis mutandis* applicable to lip-print evidence.

¹⁷⁰ Visser “Dilemmas of Science and the Criminal Law: A South African Perspective” 2009 *Obiter* 571; Bellengere *et al The Law of Evidence* 334.

- a) Lip prints are as unique as fingerprint evidence and are therefore evidence with heavy evidentiary weight as they can identify a person without any doubt. For that reason, there must be certainty that lip prints are correctly analysed and that comparisons between such evidence and samples from suspects are accurately and adequately done.
- b) Just like fingerprints, lip prints consist of patterns that require scientific examination and analysis in order for a comparison to be made. It speaks for itself that such analysis cannot be done by the ordinary man on the street. A lip-print expert is therefore required to perform such a duty.

An expert witness is a witness who has expertise and knowledge in a certain field. Such a witness can independently assist a court in reaching a conclusion on an issue in the proceedings before it.¹⁷¹ It must be kept in mind that the opinion of the expert witness does not replace the conclusion that the court must reach. It is still the responsibility of the court to interpret the evidence before it and to reach an appropriate conclusion.¹⁷² The expert witness is therefore merely providing guidance to the court as to the nature of the evidence, as well as what the conclusion might possibly be.¹⁷³ It is a specialised form of opinion evidence that is admissible, as it is helpful to the court.¹⁷⁴ This point was clearly articulated by Satchwell J in *Holtzhauzen v Roodt*.¹⁷⁵

“It would be irresponsible for myself as a judicial officer, who is lacking in special knowledge and skill, to attempt to draw inferences from facts which have been established by evidence, without welcoming the opportunity to learn and to receive guidance from an expert who is better qualified than myself to draw inferences which I am required myself to draw.”¹⁷⁶

An expert witness can present her evidence on lip-print impressions by way of affidavit.¹⁷⁷ However, expert witnesses are frequently requested to testify orally during trials with regard to their findings.¹⁷⁸ In short, the expert witness presents the court with a comparison chart and describes how she

¹⁷¹ Bellengere *et al* *The Law of Evidence* 397; Zeffert *et al* *The South African Law of Evidence* 344.

¹⁷² Bellengere *et al* *The Law of Evidence* 397; Zeffert *et al* *The South African Law of Evidence* 344; Schmidt *Bewysreg* 570.

¹⁷³ Zinn and Dintwe (eds) *Forensic Investigation* 271; Zeffert *et al* *The South African Law of Evidence* 344. In *R v Nksatlala* 1960 (3) SA 543 (A), it was stated that “[a] court should not blindly accept and act upon the evidence of an expert witness, even of a fingerprint expert, but must decide for itself whether it can safely accept the expert’s opinion. But once it is satisfied that it can so accept it, the court gives effect to that conclusion even if its own observation does not positively confirm it” (546).

¹⁷⁴ Bellengere *et al* *The Law of Evidence* 397; Zinn and Dintwe (eds) *Forensic Investigation* 271.

¹⁷⁵ 1997 (4) SA 766 (W) 772E–F.

¹⁷⁶ See also Bellengere *et al* *The Law of Evidence* 397; Schwikkard *et al* *Principles of Evidence* 91.

¹⁷⁷ Bellengere *et al* *The Law of Evidence* 334; Schwikkard *et al* *Principles of Evidence* 368. Also refer to s 212(4) of Act 51 of 1977 as amended by s 4(a) of Act 6 of 2010, and heading 4 2 in this regard.

¹⁷⁸ Bellengere *et al* *The Law of Evidence* 334; Schwikkard *et al* *Principles of Evidence* 368.

has made the comparison.¹⁷⁹ She indicates points of significance in the compared material, provides an expert opinion on her findings, and furnishes reasons on which such expert opinion is based.¹⁸⁰ In the context of lip-print evidence, the expert witness must meet the following criteria when presenting her evidence to court:¹⁸¹

- a) she must prove that she has specialised knowledge, training, skills and necessary experience in cheiloscopy,¹⁸² putting her in a position to be of assistance to the court relating to an issue before it;
- b) she must be an expert with regard to the issue(s) that she will testify about – namely, the linking (or not) of an accused to a lip-print impression found at a crime scene; and
- c) she must not base her expert opinion on a hypothesis, but on facts that are relevant to the lip-print impression that was found, which facts are reconcilable with other evidence that is presented in the same case.

If lip-print evidence is collected by fingerprint experts, such experts should preferably undergo training on lip-print impressions.¹⁸³ This is because there are differences in examining fingerprints and lip-print impressions respectively.¹⁸⁴ Should there be no expert at the crime scene, and a lip-print impression is detected, such impression should be photographed, while the print itself should be preserved in a closed container in order for the lip-print expert to examine and analyse it at a later stage.¹⁸⁵

The first expert witness on lip-print evidence testified in 1966 in Poland.¹⁸⁶ In this case, a lip-print impression was detected on a section of window glass at the scene of a burglary.¹⁸⁷ The expert witness concluded that such lip-print impression did not match the lip-print sample of the suspect.¹⁸⁸ This clearly shows the importance of having an expert to examine and analyse lip prints. Furthermore, it shows that such expertise can assist the course of justice to a significant and accurate extent so that the correct persons are brought to justice.

¹⁷⁹ Bellengere *et al* *The Law of Evidence* 334; Schmidt *Bewysreg* 307.

¹⁸⁰ Bellengere *et al* *The Law of Evidence* 334; Schwikkard *et al* *Principles of Evidence* 368. This is usually the procedure followed during the presentation of expert evidence in the case of fingerprint evidence. There is, logically speaking, no reason why there should be any deviation during the presentation of expert evidence based on lip-print evidence.

¹⁸¹ See Zinn and Dintwe (eds) *Forensic Investigation* 272 for a general discussion in this regard.

¹⁸² Such an expert is referred to as a cheilosopic expert.

¹⁸³ El-Ghamry *et al* 2014 *IRJABS* 28.

¹⁸⁴ *Ibid.*

¹⁸⁵ *Ibid.*

¹⁸⁶ Prabhu *et al* 2012 *J. Forensic Dent. Sci.* 51.

¹⁸⁷ *Ibid.*

¹⁸⁸ *Ibid.*

5 LIP PRINTS AND FINGERPRINTS: SIBLING RIVALRY OR THE PERFECT MARRIAGE?

Evidence is used to prove points that are in dispute in a particular case. In every case, there are different types of evidence that can be used in order to reach a conclusion. Sometimes, evidence fills gaps in order to complete a scenario. For example, where a gun (which has been confirmed as the murder weapon in a case of murder) is found in possession of a suspect, the gun in itself is not conclusive evidence that the suspect handled it at any given time. It may be that the gun was planted in his possession by someone else in order to frame him for murder. However, where the suspect's fingerprints are found on the gun, it is easier to connect him with the handling of the weapon. At other times, evidence is confirmatory or corroborative, meaning that it strengthens an already apparent state of events. The bank-robbery scenario can serve as an example once more. Suppose that, apart from the lip print found on the glass door of the bank, the crime-scene investigators also found fingerprints on one of the counters of the bank. If these fingerprints match those of the accused in this instance, the presence of fingerprints corroborates the lip print, pointing an undoubting finger at the accused. This is particularly helpful where an incomplete lip print has been found, but there is evidence that the accused is notorious for robbing banks in a disguise involving lipstick.¹⁸⁹ Furthermore, a lot of offenders use gloves, with the result that no fingerprints are found on crime scenes. However, gloves do not rule out the presence of lip prints at a crime scene, especially in a scenario similar to the bank robbery. Cheiloscopy therefore becomes supportive of dactyloscopy in such a case.¹⁹⁰

Lip-print evidence should not be in competition with fingerprint evidence, or viewed as being inferior; rather, it is complementary. In other words, lip-print evidence can corroborate fingerprint evidence – not that it is usually necessary for fingerprint evidence to be corroborated. However, incomplete or partial fingerprints may be found at a crime scene, while there are complete lip prints. In such instances, suspects may be identified based on the lip print and can have their fingerprints taken in order to have these compared to the partial fingerprint found.

The importance of the proverbial perfect marriage between fingerprint and lip-print evidence is quite apparent in the Illinois case of *People v Davis*.¹⁹¹ In this case, *inter alia*, a set of upper and lower lip prints had been found on the sticky side of a roll of duct tape.¹⁹² At the trial, a forensic expert in latent-print examination testified that lip-print evidence is unique in the same way that fingerprint evidence is and that it is therefore a positive way of identifying a person.¹⁹³ A document examiner testified that lip prints are unique and that a

¹⁸⁹ This statement is subject to such notoriety being accepted on the basis of the doctrine of similar-fact evidence.

¹⁹⁰ Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 595.

¹⁹¹ *People v Davis supra*; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 3; Sharma *et al* 2009 *J. Forensic Dent. Sci.* 24.

¹⁹² *People v Davis supra*.

¹⁹³ *People v Davis supra*; Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 597.

lip-print comparison is an accepted form of identifying a person.¹⁹⁴ This examiner also testified that identification by way of lip prints appears in field literature on the subject matter and is therefore regarded as an accepted form of identification in the forensic science community.¹⁹⁵ He stated that he is not aware of any dissent in this community to using lip prints to make a positive identification.¹⁹⁶ The accused, or the defendant as he is referred to in this case, objected to the admissibility of the lip-print evidence, stating *inter alia* that the method used by the experts to obtain such evidence, as well as the identification based on such evidence, was not reliable.¹⁹⁷ The method entailed that the expert took a lipstick print from the accused on paper, and did a side-by-side-comparison with the lip-print impression found on the sticky side of the duct tape.¹⁹⁸ The court found that there was nothing unreliable about the method used by the expert, or the resulting identification, as the same methodology is applied in the case of fingerprints and is accepted by the forensic science community.¹⁹⁹

It is therefore clear that there is good synergy between fingerprints and lip prints and that fingerprints should not be viewed as being superior to lip prints. The fact that both types of print are unique, and consequently deliver an accurate identification of a person, causes these types of print to be of primary importance when examining and collecting evidence from every crime scene.

6 A LIP-PRINT DATABASE

It goes without saying that a lip-print database would be an advantage to the criminal justice system, as a collection of lip prints would then be readily available for comparison with those found at crime scenes. However, there is currently no dedicated lip-print database. Wherever ante-mortem lip-print data is available, such availability is considerably less than is the case with fingerprint data.²⁰⁰ It is highly recommended that a lip-print database should be kept in the same way that a fingerprint database is.²⁰¹ The basis for such recommendation is that cheilosopic evidence is as unique as dactylosopic evidence, and therefore plays an equally important role.²⁰²

The obvious suggestion is that a separate database should be developed and maintained. With regard to fingerprint evidence, there are established systems. The Integrated Automated Fingerprint Identification System, more commonly known by its acronym IAFIS, is a computerised identification system that is used by the Federal Bureau of Investigation (FBI) in the

¹⁹⁴ *Ibid.*

¹⁹⁵ *Ibid.*

¹⁹⁶ *Ibid.*

¹⁹⁷ *Ibid.*

¹⁹⁸ *Ibid.*

¹⁹⁹ *Ibid.*

²⁰⁰ Kannan *et al* 2015 *IJFP* 92.

²⁰¹ *Ibid.*

²⁰² *Ibid.*

United States of America.²⁰³ EURODAC is the European fingerprint database for the identification of asylum seekers and irregular border crossers.²⁰⁴ The National Automated Fingerprint Identification System is the Australian equivalent of IAFIS.²⁰⁵ There is therefore no reason, theoretically speaking, why a lip-print database cannot be created and properly maintained in South Africa.

Another option is to create a lip-print database alongside a dental records database.²⁰⁶

It is submitted that, in South African law, there is some support for a proper lip-print database, but also some potential obstacles. As already mentioned, lip prints may be taken from suspects in terms of the Criminal Procedure Act.²⁰⁷ Such lip prints must be retained in a database following the conviction of an adult person.²⁰⁸ The same applies following the conviction of a child.²⁰⁹ These provisions would facilitate the maintenance of a lip-print database.²¹⁰ However, the Act also provides for the destruction of lip prints collected from a crime scene in the following instances:²¹¹

- a) where a decision has been made not to prosecute a person;
- b) where a person has been on trial, but is found not guilty;
- c) where a person has been found guilty, but such conviction is set aside by a superior court;
- d) where a person is discharged at a preparatory examination;
- e) where no criminal proceedings relating to such lip-prints have been instituted against a person; and
- f) where the prosecution declines to prosecute a person.

In these instances, lip prints may not be kept in a database, thus impeding the collection of lip-print data for future use and comparison. It would have been more conducive to the criminal justice system if such prints could also be stored in the mentioned database. It is submitted that the retention of such prints would not prejudice the person from whom they were taken, since the content of the database is protected. In this regard, the South African Police Service Act²¹² provides that the National Commissioner must

²⁰³ The Integrated Automated Fingerprint Identification System, more commonly known by its acronym IAFIS, is a computerised identification system that is used by the Federal Bureau of Investigation (FBI) in the United States of America. EURODAC is the European fingerprint database for the identification of asylum seekers and irregular border crossers. The National Automated Fingerprint Identification System is the Australian equivalent of IAFIS.

²⁰⁴ *Ibid.*

²⁰⁵ *Ibid.*

²⁰⁶ Kannan *et al* 2015 *IJFP* 92.

²⁰⁷ 51 of 1977. See heading 4 2.

²⁰⁸ S 37(6)(a)(i) of 51 of 1977.

²⁰⁹ S 37(6)(a)(ii) of 51 of 1977.

²¹⁰ In terms of s 37(6)(c) of 51 of 1977, such lip prints must be stored in a database established by the National Commissioner, as provided for in Chapter 5A of the South African Police Service Act 68 of 1995.

²¹¹ S 37(6)(a)(iii) of 51 of 1977.

²¹² 68 of 1995.

secure the integrity of information on the database by putting in place appropriate, reasonable, technical and organisational measures to prevent loss of, damage to or unauthorised destruction of information,²¹³ as well as unlawful access to or processing of information in the database.²¹⁴

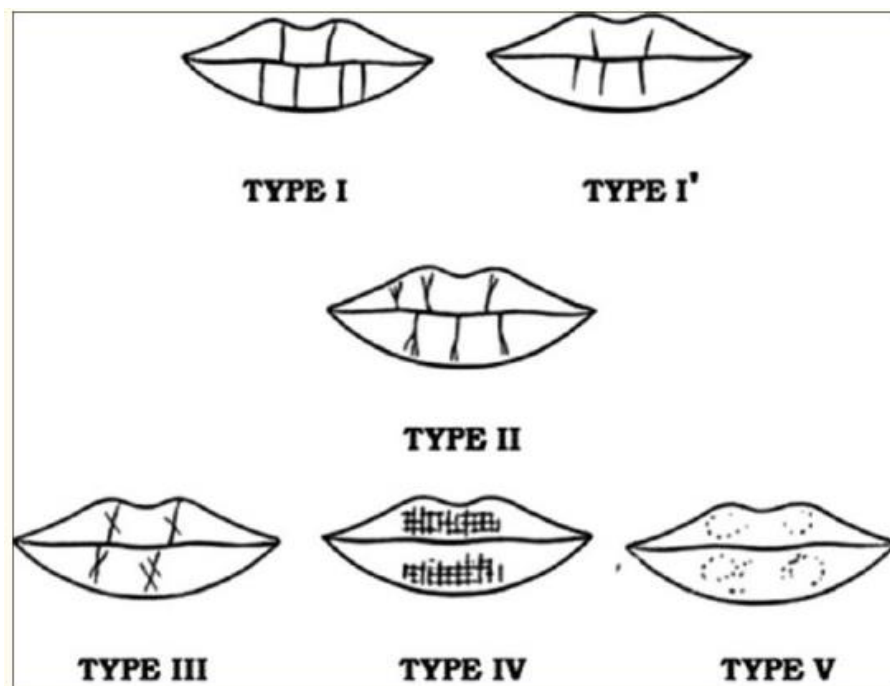
Nevertheless, it appears that South Africa is still a long way from having a proper lip-print database for the benefit of the criminal justice system.

7 CONCLUSION

Lip-print evidence is unique in the same way that fingerprint evidence is. The collection methods, as well court presentation by cheilosopic experts, are similar. The only difference, in principle, is that lip prints are not encountered at crime scenes as frequently as fingerprints are. However, this is not a reason to neglect cheiloscropy or new contextual developments. The uniqueness and consequent high probative value of lip prints make them a necessary tool for the fight against crime. Investigators must therefore ensure that they examine crime scenes for lip-print impressions, especially where it appears that there is a dearth of fingerprints. Authorities should develop a dedicated lip-print database in the near future to facilitate the identification of offenders. In a modern world, where crime is a daily occurrence, such a vital step would be highly desirable.

²¹³ S 15D(1)(a) of 68 of 1995.

²¹⁴ S 15D(1)(b) of 68 of 1995.

ANNEXURE A²¹⁵

Type 1: A clear-cut groove, running vertically across the lip

Type 1': A partial-length groove of Type 1

Type II: A branched groove

Type III: An intersected groove
























Type IV: A reticular pattern

Type V: Other patterns

²¹⁵ The sketch, provided in the Annexure, is from Dineshshankar *et al* 2013 *J. Pharm. Bioallied Sci.* 596.

ANNEXURE B²¹⁶

Table 5. Kasprzak classification on individual features of lip pattern on lips.

An eye		A closing bottom furcation	
A hook		A delta-like opening	
A bridge		A simple opening	
A line		A closing top bifurcation	
A dot		A pentagonal arrangement	
A rectangle like		A branch like top bifurcation	
A triangle like		A star like bifurcation	
A group of dots		A fence	
A simple top furcation		A branch like bottom bifurcation	
A simple bottom furcation		Double fence	
A double eye			
Hexagonal arrangement			
Crossing lines			

²¹⁶ The sketch, provided in the Annexure, is from Kannan *et al* 2015 *IJFP* 91.