



Development of latent Dermal Ridges present on Fruits and Vegetables

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Abstract

Latent prints can be encountered at any kind of surface of contact. These latent prints, which are carrying information about the identity of an individual, are chance prints and they needed to be developed. Foods (fruits and vegetables) are notoriously surfaces for recovery of latent dermal ridges, which are often overlooked as evidence of suspects. Some methods and techniques have been using for the recovery and development of latent prints from different surfaces. In the present study, we utilized fruits and vegetables (Banana including green and ripe, Eggs, Onion, Tomato, Potato, Brinjal, Bottle Guard, capsicum). For the development and recovery of latent dermal ridges Black powder, Silver Gray, Orange Fluorescent, and Iodine fuming were used. The results of the study shows that the dermal ridges were successfully developed which were clear, identical and carrying enough information about an individual.

Keywords: Fruits and vegetables, Latent Prints, development, dermal ridges.

Introduction

The dermal ridges on the palm, fingers, sole and toes are formed very early in foetal life and except for growing in size; remain unaltered throughout the life of an individual^{1,2}. The ridges are studded with sweat pores which secrete sweat that keeps the ridges moist. As such whenever something is touched or held the finger or palm will leave their imprint on the surface of the substrate which cannot be seen by the naked eye³⁻¹¹. These prints, called latent prints, can be developed and made visible by a battery of developing techniques. Since no two fingerprints, even if they are of the same individual, are exactly alike, they are very helpful in identifying a specific individual.

The quality of the developed latent dermal ridges is dependent on the substrate on which they are likely to be present. In this paper an attempt has been made to develop fingerprints on some fruits and vegetables¹³⁻¹⁵.

Material and methods

A number of fruits and vegetables (Banana, Egg, Brinjal, Tomato, Onion, Bottle guard, Potato, Capsicum,) obtained from the market were cleaned, dried and used as the substrate for developing fingerprints.

All the vegetables and fruits were washed in normal water while the eggs were cleaned with acetone, dried with chemical free paper/ paper towel, and were kept at room temperature for 5-7 hours.

A number of subjects were asked to hold the fruits, vegetables and eggs in their hand so as to deposit their fingerprints on them. These fruits and vegetables were kept then in laboratory

on white filter paper at room temperature. Developing powders including iodine powder were then applied on all fruits and vegetables to make the hidden prints visible^{16,17}. All the samples were divided in equal ratio to see which developer actually give excellent and conclusive results. Photograph of the developed prints were taken with the help of a digital S860 Samsung camera with 8.1 megapixel and zoom quality of 6.3-8.9mm.

It was observed that fluorescent powder gave much better contrast on different type of surfaces under UV such as banana, Brinjal, Bottle guard, Capsicum, and Eggs. The developed prints could be clearly observed by naked eyes^{18,19}. Black powder gave good contrast on eggs and Potato while Iodine powder gave a contrast on eggs. The visibility of the prints was very clear. The developed prints on different surfaces are shown through photograph taken with the help of a digital S860 Samsung camera with 8.1 megapixel and zoom quality of 6.3-8.9mm.

Results and Discussion

It was observed that all the enhancement techniques were reactive and giving fluorescent on fruits and vegetables. The latent ridges present on the fruits and vegetables were successfully developed and having enough information about the identity of an individual^{20, 21}. All physical developers have different reaction on fruits and vegetables and it was observed that fluorescent powder give much better results than other developers on green fruits and vegetables, while on eggs could be developed by spraying of powders including iodine powder^{22, 23}. The developed dermal ridges were clear with minutiae details of an individual, which gives enough information for conclusive identification?

Table-1
Development of dermal ridges on fruits and vegetables with different battery of powders

Quantity	Fruits	Black powder	Silver gray	Orange Fluorescent	Iodine Crystal Powder
12	Banana(Green+ ripe)	Nil	Average	Excellent	Average
6	Tomato	Nil	Average	Excellent	Nil
6	Potato	Excellent	Nil	Nil	Average
8	Brinjal	Nil	Average	Excellent	Average
6	Egg	Excellent	Nil	Excellent	Excellent
6	Capsicum	Nil	Average	Excellent	Average
6	Bottle Guard	Nil	Average	Excellent	Average
6	Onion	Nil	Average	Excellent	Nil

In this graph, the reactions of all developers with the samples are shown according to their fluorescent on fruits and vegetables.

Development of fruits and vegetables with different battery of powders. All the developed dermal ridges on fruits and vegetables are shown in the given figures below:



Figure-1
 Developed dermal ridges on capsicum



Figure-2
 Developed dermal ridges on Bottle Guard



Figure-3
 Developed dermal ridges on Onion



Figure-4
 Developed dermal ridges on Eggs



Figure-5
 Developed dermal ridges on Potato

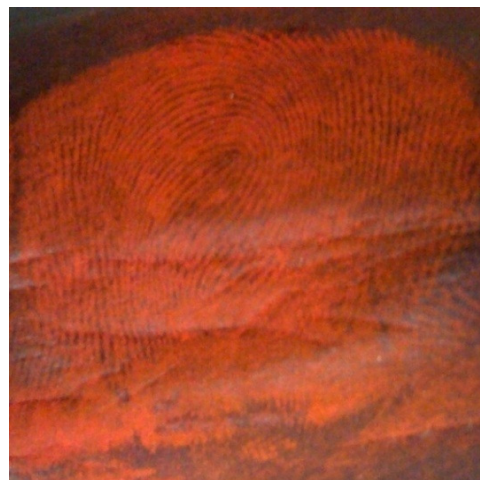


Figure-7
 Developed dermal ridges on Brinjal

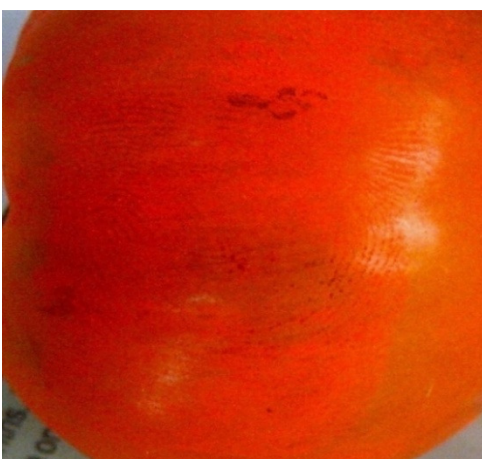


Figure-6
 Developed dermal ridges on Tomato



Figure-8
 Developed dermal ridges on Green Banana

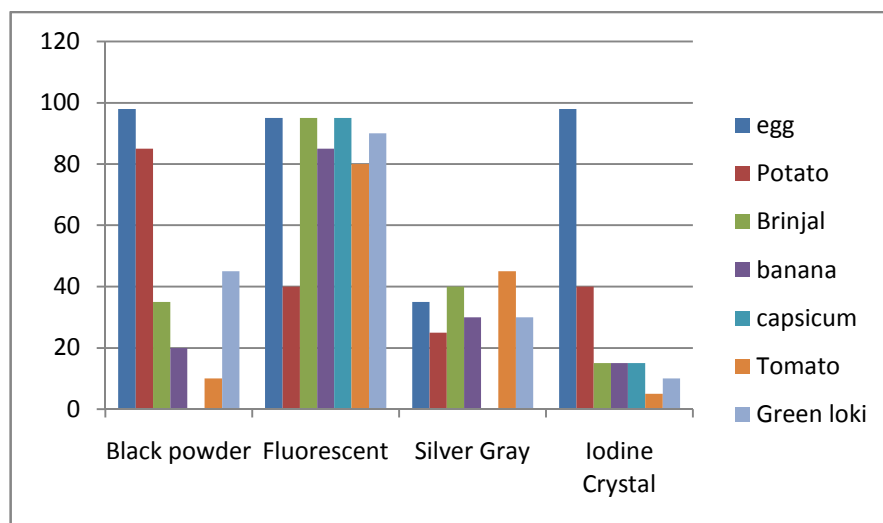


Figure-9
 Represent the development of dermal ridges on fruits and vegetables at scale

Conclusion

The uniqueness of dermal ridges (Palmar or planter) of an individual has been accepted by forensic investigators as a valid means for identification. The prints in latent form which need to be visualized can be encountered at any surface of contact from crime scene which can be added as an evidence for identification of suspect. In this study, we find out that if any eatable (fruits or vegetables) are found at scene of crime; it be added as an evidence for identification of suspect. The result shows that the recovery and enhancement of latent dermal ridges have been successfully done by using a battery of powders on fruits and vegetables. Florescent powder has been observed to give good results on all the surfaces.

The visualized/developed dermal ridges were clear, identifiable and having enough information for nabbing the suspects.

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