

# Natural Methods for the Identification of Fingerprint by Using Sandal Wood Powder

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**Abstract:** Different methods have been suggested for the development of latent fingerprints on different surfaces. Fingerprint are an important kind of material evidence with the key function in personal identification. Fingerprint are unique and lifelong to everyone. This paper presents a new natural powdering method which is simple and non-toxic for the development of latent fingerprint. In investigation a less expensive, simple and easily available sandal wood powder. A commonly found in Indian trees/plants. It is found that it gives very clear result in majority of the surfaces. This powder developed fingerprints on different surfaces like metal surfaces, clay surfaces, non-porous surfaces, and computer/ mobile surfaces. It shows clarity of ridges. It successfully developed latent fingerprint on all the surfaces except skin and cotton by using this method. In this method using AgNo<sub>3</sub> Nano synthesis particles by using extraction process of the sandal wood powder. We have to done successfully developed latent fingerprint powder.

**Keywords:** latent fingerprint, ridges, AgNo<sub>3</sub>.

## 1. Introduction

Finger prints are natural unique patterns formed by friction on epidermal ridges and furrows, which appear on the pads of fingers and thumbs. Fingerprints left in clay by early artisans and scribes served as a kind of signature. During China's tang dynasty, clerks used inked fingerprints on business contracts this practice was not so different from using a chop mark or, Europe. In another word study of fingerprints is known as Dactyloscopy. They have never been observed repeating in any human being in the history of Dactylography. Dactyloscopy is Greek word which means identification of individually by means of examination of the lines on the tips of the fingers. The skin of fingers shows the sweat gland, which release sweat consisting of water, salt and urea which release oils on the surfaces of skin. The products of these two glands lead to constitute a finger prints, a mark that is left when we touch something. There are three types of fingerprints that is latent prints, plastic prints, patent prints are occur when a foreign substance on the skin of a finger comes in contact with the smooth surfaces of another object. A plastic print having three-dimensional print made as indentations in soft material such as fresh paint, putty, or wax also called an indented or molded. A visible print is left by a finger that has touched coloured material such as blood, paint, ink, grease, chalk, mud, or

sometimes even dust. A latent print is essentially invisible and must be developed by chemical or physical means and latent prints are fingerprint impressions secreted in a surface or an object and are usually invisible to the naked eye.



Fig. 1.

Source:

<https://www.google.com/search?q=patent+fingerprint&tbm=isch&ved=2ahUKewjskeqplNn-AhUim-YKHU6-CRsQ2>

Physical method which are used for the development of latent fingerprints. Fingerprint powder applied lightly to a non-absorbent surface with a soft brush. The investigators need to prevent damaging the print when trying to develop it. camel hair is the most common animal hair used to make fingerprint. Physical development of fingerprints using powders is just one of selection of methods used to develop fingerprint. 'Dusting' is a used as part of an array of technique to develop fingerprints, but is often used on larger areas in a crime scene which cannot be removed for analysis, or cannot be subject to more rigorous analysis for other reasons.

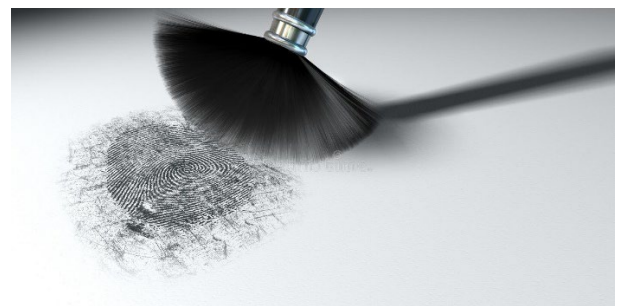


Fig. 2.

Source:

<https://www.google.com/search?q=dusting+powder+fingerprint+method&tbm=isch&ved=2ahUKEwiG9KGDldn-AhXJErCAHfapAd8Q2>

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## 2. Objectives

- 1) To identify a new technique for development of latent fingerprint.
- 2) This powder easily available.
- 3) To develop an organic and chemical fingerprint powder unlike the presently used chemical powders.
- 4) This powder is less expensive than other powders.

## 3. Materials and Methodology

### A. Material Required

1. Camera
2. Mask
3. Gloves
4. Morter pistol
5. Lens
6. Brush

### B. Methodology

Firstly, taking sandal wood are prepared by drying and grinding to get a very fine powder to the level of talcum powder by using mortar pistol. Then 10 g crushed sandal wood powder is mix with distilled water and boil using burner for 30 min.



Fig. 3. Extraction of sandal wood powder

Then cool the extract of sandal wood powder and filter it using Whatman No. 1 filter paper.

The silver nitrate nanoparticle were processed by treating 3.397 g of silver nitrate in 200 ml distilled water. Then silver nitrate is kept in magnetic stirrer for 30 min and 5ml sandal wood powder extract drop by drop in silver nitrate solution by using pipette.

After addition of the mixture has turned slowly into reddish brown colloid suspension which shows the reduction of  $Ag^+$  ions into metallic Ag Nanoparticle by using contribution phytochemicals of sandal wood powder extract.

The mixture of sandal wood powder extract ad silver nitrate solution which turns to dark brownish in colour is confirmation of reduction  $Ag^+$  ions into metallic ions. The colloid solution is kept at air oven for drying at temp 200c for 1 day.

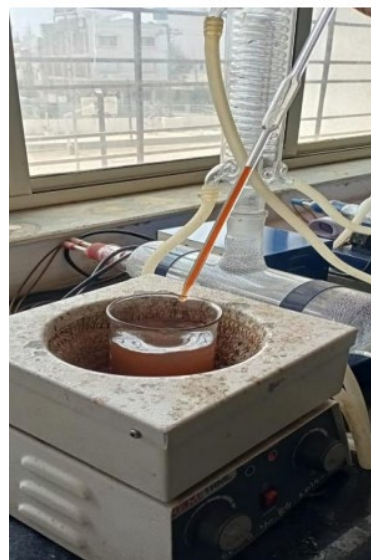


Fig. 4. Powder prepared in Magnetic stirrer



Fig. 5. Developed powder from Petry dish

After completion of 1 day remove the Petry dish from air oven dark brownish colour were formed. Then crushed the developed powder from Petry dish by using blade. The surfaces were selected first where the impression of fingerprint is to be left and then developed by using sandal wood powder. Firstly, the subject asked to wash and dry their hands clean to eliminate the possibility of contamination by any dirt and dust for taking the impression of fingerprint. Then take the impression of the subject on to the given surfaces. The impression of the subject was taken on different surfaces then the latent fingerprint is developed by using powder method.

The development of latent prints is done after taking impression of the subject on various surfaces (non-porous) by powdering method using sandal wood powder. The powdering method has been used a suitable brush such as ostrich feather brush. The powder sprinkled over the surfaces where the latent fingerprint was present. The excess powder was removed by gentle tapping and by slowly using the brush over the prints and to get a clear print. This powder has applied on non-porous and porous surfaces. After developing the latent print, it was photographed. This method was applied on the surfaces of glass surfaces, non-porous wooden surfaces, metal surfaces, mobile surfaces, plywood surfaces, freeze surfaces etc. where the subject fingerprint impression has been taken. Before performed this method, we confirm that wearing mask, gloves, and other material to avoid the contamination of latent fingerprint. After deposition the prints were left in the room

condition. The experiment was conducted in the month of February – March. The temperature during the experimental work varied from 26 to 34 degree Celsius and 72% relative humidity.

#### 4. Result

Latent fingerprint were developed by using sandal wood powder. Compared to other development techniques used for the enhancement of latent fingerprint, this powder is less expensive and easily available and it will give good result. The sandal wood powder will give good result on the all surfaces like metal surfaces, mobile surfaces, plywood surfaces, etc. It's clearly visible for naked eyes and easily find out the character of fingerprints. lifting of fingerprint is also easily handled and clear print are developed after the lifting method.

Visualisation of latent fingerprint by sandal wood powder.

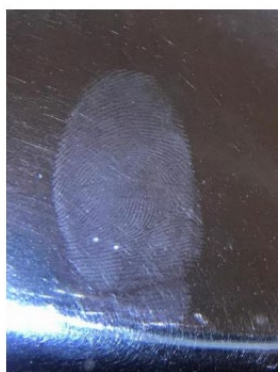


Fig. 6. Developed fingerprint on steel surface



Fig. 7. Developed fingerprint on clay surface



Fig. 8. Developed fingerprint on plywood surface



Fig. 9. Developed fingerprint on glass surface

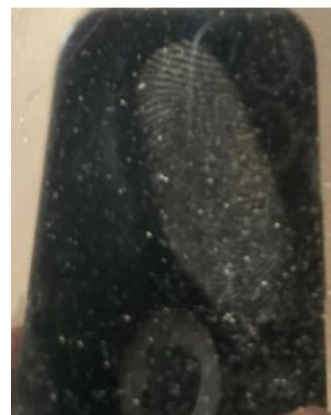


Fig. 10. Developed fingerprint on mobile surface



Fig. 11. Developed of fingerprint on iron surface

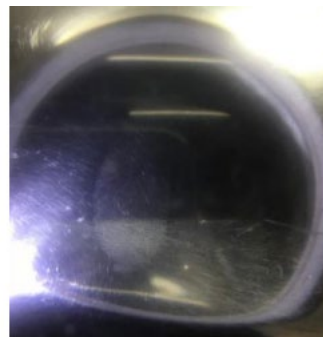


Fig. 12. Developed fingerprint on laptop surface

## 5. Conclusion

In this paper study, the fingerprint is visualized by using the sandal wood powder are easily available and not harmful compared to other powders. This powder is less expensive easily available in market. Further work on the fingerprint department under various conditions such as temperature variation humidity from the surfaces of human skin and other variant surfaces can be done.

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