



Cawangan Kedah  
Kampus Sungai Petani

Faculty of Administrative  
Science and Policy Studies

# i-SPIKE 2021

*Leading An Artificial Innovation In Knowledge, Education And Design*

## **i-SPIKE 2021 INTERNATIONAL EXHIBITION & SYMPOSIUM E-PROCEEDINGS**

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## ENHANCEMENT OF LATENT FINGERPRINT USING DYED EGGSHELL POWDER

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### ABSTRACT

**Background:** History has told that Chinese used the fingerprint to sign legal documents far back to three thousand years ago. An Englishman named Francis Galton has conducted an extensive research regarding fingerprint. Most importantly, he concluded that no two fingerprints are the same and the pattern remained unchanged throughout individual's life. Mainly, it is divided into two which are visible and latent fingerprint. Obviously, locating the latent fingerprint is much more difficult and requires the use of technique to make the print visible. One of the most common way to locate fingerprint in non-porous surface is fingerprint powder. Experienced examiners find that grey and black powders are adequate for most latent-print work. The examiner will select the powder which afford the best color contrast with a surface being dust. In addition, there are other types of powders are available for developing the latent prints. These include magnetic powder and fluorescent powder. However, an innovation or invention is highly valuable in science and others field. Therefore, the idea of using waste material to enhance the latent prints is studied. Eggshell is a solid waste, with production of several tons per day. Eggshell is mostly sent to the landfill with a high management cost. It is economical to transform the eggshell waste to create new values from these waste materials. Current potential of eggshell are biodiesel, absorbent, biomaterial and fertilizer. Therefore, it is highly beneficial to explore the use of this common household waste product into a material to be used in criminalistics.

**Objectives:** This innovation aimed to enhance the latent fingerprint using dyed eggshell powder on porous and non-porous surface.

**Methods:** Clean and wash the eggshells with distilled water. Dry the eggshells in the oven for overnights. Blend the dried eggshells in the dry blender until it pulverized into a granular form. Add food dyes to give a color to the eggshells powder. Store eggshells powder in tight container away from heat and moisture.

**Results and Discussion:** The latent fingerprint on the beaker was enhanced by using dyed eggshell powder. The ridges and minutiae can still be seen. This shows that the eggshell powder can be used instead of expensive black powder from the fingerprint kit. The usage of black powder not only involves hygiene issue, but it is also a health concern for technicians who breathe in the powders. Most black fingerprint powders contain rosin, black ferric oxide and lampblack. It also contains inorganic chemicals such as lead, mercury, cadmium, copper, silicon, titanium and bismuth which can affect human health when we are continuing

exposure with it. However, biowaste chicken eggshells contain high amounts of calcium carbonate which is non-toxic and it safe towards human and environment. It is simple and save time as it does not need many sample preparations. Furthermore, by using eggshell powder would be cheaper and most widely available.

**Conclusions:** In conclusion, the latent fingerprint on porous surface and non-porous surface can be enhance by using dyed eggshell powder.

**Keywords:** Latent fingerprint, Black powder, Dyed eggshell powder, Porous surface, Non-porous surface.





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