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Latent Print Enhancement Using Plant-Based Powders Derived From Date Seed

Abstract:

As fingerprints are unique, permanent, and everywhere they continue to be one of the most reliable methods in forensic identification. Latent fingerprints, which are left on different surfaces, are usually not visible to the naked eye and need to be developed properly in order to be seen. Despite being widely used, conventional fingerprint powders are frequently synthetic, expensive, and cause health and environmental issues, which is the reason why individuals are looking for natural and biodegradable alternatives.

The use of date seed powder, which is derived from agricultural waste, as a green medium for latent fingerprint development is explored in this work. A variety of non-porous surfaces, including mirrors, glass slides, tempered glass, and compact discs, were used to evaluate the powder. The results revealed the powder's good adhesion and ability to produce identifiable ridge patterns with appropriate intensity. However, granulation was seen to some extent and ridge minutiae were not always clearly defined, which affected the visibility of tiny details. Despite these drawbacks, the powder worked well for overall ridge visibility and shows promise as an affordable, environmentally responsible substitute for synthetic powders in forensic applications.

Keywords: Latent fingerprints; Date seed powder; Forensic science; Eco-friendly fingerprint powders; Non-porous surfaces; Biodegradable materials

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