

First evaluation of new fingerprinting methods for ivory

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A 28-day old fingerprint on ivory enhanced with reduced scale powder. Credit: Metropolitan Police Service

Scientists from King's College London and University College London have collaborated with imaging and fingerprint experts from the Metropolitan Police to validate the use of new techniques for retrieving fingerprints from ivory for the first time.

The findings, published in the journal *Science and Justice*, could lead to wider use of fingerprinting methods in the field to more easily identify poachers in regions with high levels of ivory-related crime.

Ivory has previously been considered a difficult material to obtain fingerprints from and such techniques have not been commonly used when illegally sourced ivory has been seized despite fingerprinting being one of the oldest, simplest and most cost-effective forensic tools.

Ivory itself is a highly porous, ridged material and fingerprints enhanced with conventional powders have been largely ineffective as a result. This presents a significant challenge for police and forensic experts to develop the level of fingerprint detail required for an accurate identification.

However in recent years, newer powder materials have emerged for fingerprinting. These are composed of smaller particles, which allow for more detail to be observed as they adhere better to smaller amounts of fingermark residue left behind.

The latest study tested three types of powders on three seized elephant tusks loaned by the Metropolitan Police Service's Wildlife Unit. Those involved in the study compared two of the new powders to a more

traditional powder using a variety of tests.

The team found that the newer reduced-size powders were able to provide clearer, useable fingerprint detail that is vital for identifying the donor. Reduced size powders stuck more easily to remaining fingerprint residues than the more traditional powders, despite the ridged and porous nature of the ivory surface.

The clarity of ridge detail was found to be at its highest within seven days after the print was deposited, suggesting the method would work best in regions of the world that are closest to the sources of ivory.

However, imaging and fingerprint experts were also able to lift some useable prints up to 28 days after they were deposited using the new powder. The researchers also showed its applicability to rhino ivory, hippo teeth and sperm whale teeth.

Study author, Dr Leon Barron, a Senior Lecturer in Forensic Science in the Division of Analytical and Environmental Sciences at King's College London, said: 'This is the first time that fingerprinting on [ivory](#) has been thoroughly investigated and a practical solution offered. The only other study carried out over a decade ago simply showed that fingerprints were unstable and that the clarity of ridge detail was low making it difficult to make reliable identifications. Our study has shown for the first time that these newer powders could potentially be used for identifying poachers, and are especially suited to rangers working in the field.'

Director of Forensic Services at the Metropolitan Police, Mr Gary Pugh OBE, said 'The concept for this work was originally devised by an imaging expert based on his experience at crime scenes. The application has been developed into a viable front line evidence recovery technique through our Strategic Alliance with King's College London. The equipment required to put this form of fingerprinting into practice is

inexpensive and relatively easy to procure, making it a simple, cost-effective forensic tool to combat wildlife crime.'

More information: Kelly A. Weston-Ford et al. The retrieval of fingerprint friction ridge detail from elephant ivory using reduced-scale magnetic and non-magnetic powdering materials, *Science & Justice* (2015). [DOI: 10.1016/j.scijus.2015.10.003](https://doi.org/10.1016/j.scijus.2015.10.003)

Provided by King's College London

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