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Comparative Forensic Analysis of Lipsticks Using Thin Layer Chromatography and Gas Chromatography

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Abstract : Lipsticks constitute a significant source of transfer evidence, and can, therefore, provide corroborative or inclusionary evidence in criminal investigation. This study aimed to determine the uniqueness and persistence of different lipstick smears using Thin Layer Chromatography (TLC), and Gas Chromatography with a Flame Ionisation Detector (GC-FID). In this study, we analysed lipstick smears retrieved from tea cups exposed to the environment for up to four weeks. The n-alkane content of each sample was determined using GC-FID, while TLC was used to determine the number of bands, and retention factor of each band per smear. This study shows that TLC gives more consistent results over a 4-week period than GC-FID. It also proposes a maximum exposure time of two weeks for the analysis of lipsticks left in the open using GC-FID. Finally, we conclude that neither TLC nor GC-FID can distinguish lipstick evidence recovered from hypothetical crime scenes.

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