A66 Importance of Third Level Details in the Analysis of Fingerprints

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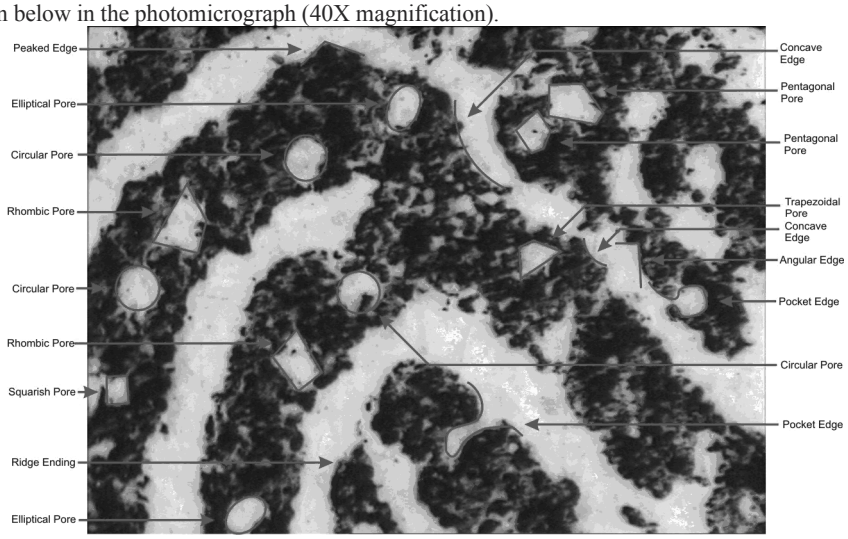
After attending this presentation, attendees will have exposure to the international community of forensic science which will help in exploring other areas of research.

This presentation will impact the forensic science community by being aware of lesser known characteristics that can produce very good results through innovation (i.e., measuring third level details which will provide an alternate method for identification of partial, smudged, or fragmented fingerprints).

The influence of cinema, television, and detective fictions has projected fingerprints as one of the most important types of evidence. The public has become most familiar with fingerprints as the best means to prove the identity of a criminal. These familiarities with fingerprints tend to provide them a greater importance in the field of criminal investigation. Fingerprints are most commonly available at the crime scene; their permanence and uniqueness leads to absolute identification of the person.

Prints recovered from the scene of crime are identified for their pattern types and compared with specimens obtained from suspects. During the process of comparison, 8-21 ridge characteristics are required to give a positive or negative opinion in the court of law (the number of characteristics varies from one country to another). If a sufficient number of characteristics is not available, the fingerprints cannot be used for identification. In many cases, the recovered fingerprints are partial, smudged, or fragmentary where the required numbers of ridge characteristics are not available. In such cases it becomes a great handicap for experts to give an opinion. In this situations, there is the need to include third level details (besides first and second level) such as the number, shape, and measurements of relative position of sweat pores and shapes of the edges of ridges which can be used to supplement the shortfall in the number of ridge characteristics to establish identity.

In the present study, an attempt has been made to collect 100 samples of partial, smudged, or fragmentary fingerprints along with complete prints from 53 males and 47 females on different types of papers. Second and third level characteristics (edgeoscopy and poroscopy) for each compromised print were marked at their correlative position to prove identity. After this, a further attempt was made to measure the distance between them. The results obtained were analyzed statistically and found significant. The range of ridge and edge characteristics (including pores) varies from 2-8/ridge; an example is given below in the photomicrograph (40X magnification).



Photomicrograph at 40x Magnification showing Second and Third Level details (ridge characteristics, shape of pores and edges)

Although the edge characteristics on fingerprints can be affected by a number of factors such as pressure applied, type of ink used, surface on which the prints are taken, and donor, the results obtained from this study are very encouraging and will be of great use to fingerprint examiners, particularly those who identify individuals from smudged or partial/fragmentary fingerprints, or any fingerprints in which only few ridges are available for comparison.

Fingerprints, Poroscopy, Edgeoscopy

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