

## Occupational Marks in Fingerprints and Palm Prints of Fishermen of Kerala (Coastal Regions)

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**Abstract :** A fingerprint is a conclusive evidence. Fingerprints are permanent and unique thus it proves the presence of a particular individual. Occupational marks found in palm prints or fingerprints can aid in individualization, thus helping the police in case investigation. Occupational marks are specific for every occupation. Analysing the occupational marks in the retrieved palm prints, it's possible to narrow down the list of suspects by the work environment. This research is regarding the occupational marks in fingerprints and palm prints of fishermen in coastal regions of Kerala. Visual examination of palm prints of fishermen is performed and data is collected to conclude that occupational marks in fingerprints and palm prints of fishermen can be used in investigation.

### INTRODUCTION

Fingerprints are unique, permanent and conclusive [1]. Therefore, fingerprints are best used for individualization. It proves the presence of a particular individual in a crime scene. Fingerprints, are the most important dermatoglyphic pattern as it is used for individualization. Occupational marks are those marks which appear in palms of a manual worker. Occupational marks are specific to each occupation, as the work environment, the tools and equipments, and amount of manual work involved differs, the types of occupational marks differs. Occupational marks can appear any part of the body which is prone to work toil.[2] The more the work toil, the more will be the occupational marks. The extent of work toil majorly plays a role in formation of occupational marks. If the hands are prone to work toil, the occupational marks appear on hands. Occupational marks in palms are found in carpenters, tailors, washer-men, blacksmiths, farmers, electricians, brass turner, bricklayer, joiner, plasterer, coal bagger, drop-stamper, hammer driver, armature winder, grinder, maintenance fitter, machine tool fitter, collier, moulder, electrode jointer, cold roller, blacksmith, rolling mill workers, etc..[2] Each occupation has different tools and different intensity of manual work. Therefore, the occupational marks are highly specific and characteristic. This becomes significant when it comes to identification of a criminal, or a missing case or an unidentified dead body. This comes to use in police investigation in identifying the suspect, victim etc. [3] This review paper is based on occupational marks found in fingerprints and palm prints of fishermen of coastal regions of Kerala. Fishing is a major occupation in Kerala. Tools used in fishing are fishing nets, bottom trawls, hand nets, etc. Bottom trawling is the major technique practiced by fishermen. Big catches using these nets is called Dragging. Fishnets are pulled back into boats after the catch. While pulling up the net, permanent distinguishing marks can appear, in long time use. Rowing the boat can also cause characteristic marks. Nowadays,

instead of rowing, motorized boats are used for fishing now.[4]Occupational marks on palms are created by fishing injuries, mainly caused by dragging of fish nets. Fishing in sea water can also produce skin dermatitis, which can also result in permanent marks in palms of fishermen.[5] Salt water boils are common in fishermen. Palm prints of 53 fishermen were collected and is visually analyzed. Occupational marks found in the palm prints collected were Scars and cuts, Blisters, and Unusual Creases. The intensity of occupational marks varies by age, work experience and work toil.

Tooth wear abrasions are the occupational marks found in teeth.Occupational marks on teeth of tailors is an attempt to standardize the parameters based on visual examination to identify the occupational marks present on teeth of tailors. This information can be used in the identification of unidentified bodies and bite marks.Author observed that as the age and experience of the tailor increases the impact of occupational habits also increases, which lead to various types of abrasions- irregular type, V-shaped, wedge shaped, flattened shaped, concave shaped and dish shaped. [6]Appearance of occupational marks in coconut tree climbers, and their implications in reference to the hazards associated with the occupation was studied. Occupational marks were found on soles and palms. This study characterizes the occupational marks in coconut tree climbers and has several forensic implications.[7]An occupational mark of screwdriver operators is a research on specific occupational marks present in hands due to handling of screw driver. It characterizes the occupational marks of screw driver operators.[8]Occupational dermatoses in cottage industry was studied in the population of Kashmir Valley in North India. 1062 workers were examined for presence of skin disorders. Male:Female in the population was 1:1.5. Cutaneous manifestations was found in 953 individuals, which is 89.7%,Callosities was found in 371 individuals which is 35% and Cumulative insult dermatitis seen was observed in 201 individuals which is 19%. Thus cottage industry workers had characterized occupational marks such as Cutaneous manifestations and Callosities.[9]

## **METHODOLOGY**

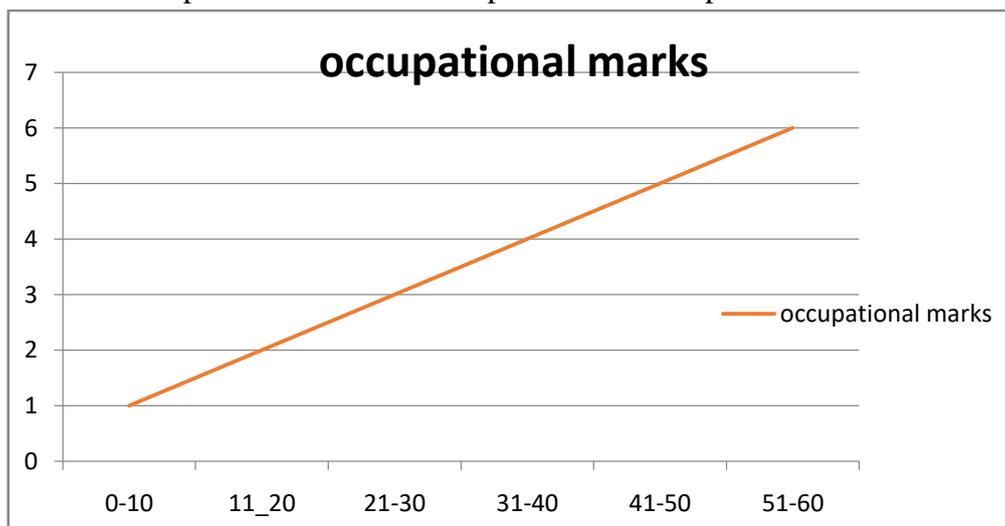
Palm print samples were collected from fishermen of coastal regions of Valiyathura and Shankhumukham of Kerala using fingerprint ink and roller in A-4 sheets. A total of 60 samples were collected and Age,work experience and name was noted. Tables and graphs were prepared after visual analysis using hand lens.

## **DISCUSSION**

To study occupational marks in fingerprints and palm prints of fishermen, 53 samples of palm prints were collected using fingerprint ink and roller in A4 sheets. Age and work experience of every fisherman was noted. Visual examination of samples was done with the help of hand lens. From observation, three different kinds of occupational marks were found in the palm prints. They were Blisters, Cuts and scars, and unusual creases. Samples with each occupational marks were tabulated separately. Most of the occupational marks coexisted. Blisters are small pocket of body fluid, which is caused by friction or manual work. These blisters appear in palm prints and fingerprints as circular or oval shapes. These occur due to contact with sea-water and

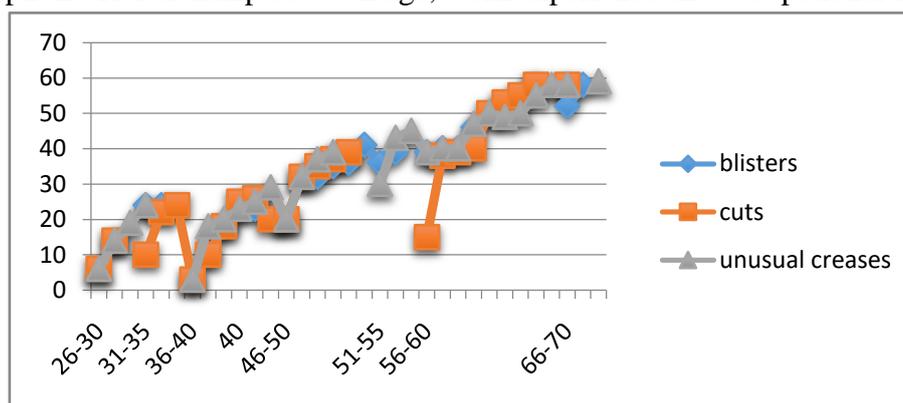
constant fishing. Cuts and scars results from injuries caused by fishing hooks or spurs and other manual works, results in cuts as fresh wounds, and it becomes permanent and is called scars. Normal creases present are distal transverse crease, proximal transverse crease, and radial longitudinal crease. Due to heavy toil, secondary creases occur in the hypothenar, thenar, and interdigital areas of palm prints. These can be termed as Unusual creases. On plotting a graph with occupational marks on X-axis and work experience on Y axis, it was observed that the occupational marks increased with work experience.

Graph-1- Effect of work experience on occupational marks



On a graph showing the relationship between age, work experience and occupational marks, line raised radially. With increase in age and work experience, occupational marks such as blisters, cuts and unusual creases tend to increase.

Graph- 2 Relationship between age, work experience and occupational marks



Palm prints of fishermen possessed occupational marks as blisters, cuts, scars and unusual creases. Characteristic marks that were present in the fingerprints and palm prints of fishermen are termed as the occupational marks. This can be used for individualization and personal identification. Figure shows Blisters, Cuts and Scars and Unusual creases respectively.



On comparison of palm prints of the normal working person, palm prints of a student, and palm prints of a fisherman, clear differences were visible. Occupational marks due to manual work or injuries were absent on the palm prints and fingerprints of the normal working person and the palm prints of the student. Figure shows the palm prints of fisherman, office worker and a student.



## CONCLUSION AND FUTURE PROSPECT

This study aimed to characterize the occupational marks present on the palm prints and fingerprints of fishermen of coastal regions of Kerala. Heavy manual work involved in seawater fishing resulted in the formation of occupational marks in fingerprints and palm prints.

This was observed on visual analysis of 53 samples which was collected from sites. This characterization of occupational marks can benefit in narrowing down a suspect based on their work environment or predicting the occupation of the suspect in an investigation. Thus personal identification was possible.

Occupational marks found in fingerprints and palm prints of fishermen in coastal regions of Kerala were characterized into 3 types- Blisters, Cuts and Scars and Unusual creases. Each sample had a mix of 3 types or a combination of 2 types. Occupational marks in fingerprints and palm prints of fishermen were more when it was compared with fingerprints and palm prints of office workers and students. Clearer prints without occupational marks were obtained in the case of prints of student and office worker. Occupational marks in fingerprints and palm prints of fishermen increased with age and years of experience. His palm prints and fingerprints showed an increased presence of occupational marks such as blisters, cuts, scars, and unusual creases. This concludes that with age and experience, occupational marks increases. Such occupational marks were only prominent after at least 10 years of experience. Most occupational marks on palm prints and fingerprints of fishermen were due to heavy toil, fishing injuries, or contact dermatitis. Cuts and scars were produced due to fishing injuries. These were observed in the thenar and hypothenar area. Unusual creases were present near the primary and

secondary creases. Unusual creases appeared due to heavy manual work. Unusual creases were observed in the palmar region and phalange areas.

Blisters were prominently observed in individuals who had more than 10 years of experience in fishing. It was prominent throughout the palm, hypothenar, thenar, and interdigital region and phalanges of fingers. Consequently, from the present research, it has been concluded that blisters, scars, cuts, and unusual creases are occupational marks observed in fingerprints and palm prints of fishermen of coastal regions of Kerala. Also, the occupational marks were relatively considerably limited in palm prints of office going worker and student, proving that occupational marks in fingerprints and palm prints of fishermen are highly specific. It was also found that with an increase in work experience, there can be an increase in occupational marks in palm prints of fishermen. Thus occupational marks in palm prints of fishermen are characterized and can be used in the forensic investigation to individualize a suspect or victim.

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