

## ВЗАИМОСВЯЗЬ ПАЛЬЦЕВОЙ ДЕРМАТОГЛИФИКИ РУК И РОСТА ЧЕЛОВЕКА

Козань Н. Н.

**Резюме.** Идентификация неизвестного лица остается одним из актуальных направлений судебной медицины. Использование простых и материально необременительных методов исследования позволяет ускорить процесс отождествления общих антропоскопических и антропометрических параметров человека. Дерматоглифические параметры дистальных, средних и проксимальных фаланг пальцев рук являются устойчивыми фенотипическими признаками человека, которые коррелируют с другими ее параметрами. Полученные с использованием современных сканеров дерматоглифические параметры являются уже оцифрованными и подлежат быстрой обработке современными компьютерными программами. Проведенное исследование позволило установить корреляционные взаимосвязи между дерматоглифическими признаками пальцев рук и ростом у лиц женского пола гуцульской, лемковской и бойковской этно-территориальных групп. Корреляционные связи между дерматоглифическими параметрами дистальных, средних и проксимальных фаланг пальцев рук и антропометрическими параметрами оказались достаточно информативными, что позволило использовать их при прогнозировании внешне опознавательных признаков человека.

**Ключевые слова:** дерматоглифика, идентификация.

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## POSSIBILITIES OF USING OF FACTOR CRITERIA OF DERMATOGLIFICAL PARAMETERS OF THE MIDDLE AND PROXIMAL PHALANGES OF FINGERS OF THE HAND IN PROGNOSING THE INCREASE OF THE UNCERTAINTY

©Kotsyubnska Yu. Z.

Ivano-Frankivsk National Medical University

**Resume.** The proposed article describes stable correlation between the type, the frequency of dermatoglyphic parameters in the middle and proximal phalanges of the fingers and the height of the person, and also the possibility of using the described connections in predicting the general phenotypic features of an unknown person is described.

**Key words:** person identification, dermatological parameters, Spirman correlation coefficient.

An open question in forensic medicine and criminalistics remains the identification of an unknown person, including the identification of fragmented, depersonalized corpses. Identification is carried out, both for the purpose of establishing a deceased person and the person who left traces on the scene of the adventure either has caused bodily injury to another person. The process of identification of an unknown person can be carried out by various methods during the forensic examination of the corpse, examination of material evidence of biological origin, as well as examination of bodily injuries on the body and on the victim. In order to identify an unknown person, a set of identification methods is used, namely: DNA-identification [1, 2]; dermatological identification [3,4], identification of a person with a dental status [5], drafting a verbal portrait [6], and others. In recent years, the interest in the dermatoglyphic identification method has grown naturally, both as a simple and easy to use, as well as materially non-burdensome method [7, 8], as well as increased interest in the study of connections between dermatological, anthropometric and anthroposcopic parameters [9, 10, 11], and the possibility of their use in diagnosing general phenotypic features of a person.

Correlation between the dermatological parameters of middle and proximal phalanges of fingers and anthropometric parameters proved to be rather informative, which allowed them to be used in predicting external signs of a person. The use of stable links between anthropometric, anthroposcopic and dermatological parameters of middle and proximal phalanges of fingers will allow to extend a number of existing techniques, which are part of the dermatoglyphic method of identification of an unknown person. The purpose of our study was to determine the correlation between the type of dermatoglyphic pattern that is localized on the middle and proximal phalanges of the fingers, the frequency of his meeting and the growth of persons of the female gender group belonging to the Hutsul, Boyko and Lemko ethno-territorial groups, who live in the Ivano-Frankivsk region. Materials for the study were dermatological parameters of proximal and middle phalanges of fingers and anthropometric parameters (growth) in women of the gender group, aged 18 to 55 years, belonging to the Hutsul, Boyko, and Lemko ethno-territorial groups. The dermatological parameters were obtained by scanning them with the Futronic's FS80 scanner and improved by converting raster prints into vector graphic objects using the VeriFinger 6.6 / MegaMatcher 4.4 Identification Technology Algorithm. In order to exclude errors in the algorithm, macrophotography was also used using a digital camera Nikon D3100 in the illumination of two LED lamps with a 1100 Lm stream of lights, placed at an angle of 45° to the horizontal surface on which the material under investigation was located. The growth of subjects participating in the study was measured using a standardized method, in a standing position using the metal anthropometer R. Martin. The materials obtained through the study were divided into three groups: Group I - anthropometric and dermatomoglyphic parameters belonging to persons of the female gender group,

Hutsul ethno-territorial group, in the number of 50 persons; Group II - anthropometric and dermatoglyphic parameters belonging to the persons of the female gender group, Boyko ethno-territorial group, in the number of 50 persons; Group III - anthropometric and dermatoglyphic parameters belonging to persons of the female gender group, Lemko ethnic group, in the number of 50 persons. All of the above persons live on the territory of Ivano-Frankivsk region. Subsequently, the statistical processing of the obtained data was performed by calculating the derivative parameters and coefficients using the Microsoft® Excel 2007 spreadsheets. Calculations were made on the Windows 7®, Intel Core2Duo 2, ATI Radeon HD4650, RAM 3GB, HDD 500GB. The main software package for statistical analysis was STATISTICA 12 for Windows. During the study, the correlations between growth, ethno-racial affiliation, gender, type of dermatoglyphic pattern and the frequency of dermatoglyphic patterns were determined, and also the arithmetic average ( $\bar{X}$ ), the mean square error of the arithmetic mean ( $S_{\bar{x}}$ ), the mean square deviation ( $\delta$ ), Student t-distribution and probability of error (P), Spearman rank correlation coefficient in order to obtain reliable results. During the study, the classification of papillary drawings of proximal and middle finger phalanges was developed, which was developed by Shpak L.Yu. [12]. According to this classification, papillary pictures on distal and proximal phalanges of fingers are divided into: 1) Direct (S). 2) With slope (L). 3) Sickle distal (Hd). 4) Sickle proximal (Hp). 5) The arc is distal (Ad). 6) the arc is proximal (Ar). 7) Distal arc / slope (L / Ad). 8) Proximal arc / with slope (Ap / L). 9) Double arc (Da). 10) Double arc / slope (Da / L). 11) Wave (V). 12. Double sickle (Dh) 13. Sickle-shaped arc (Ah) 14) Feather-shaped (F). 15) Closed (Cl). 16) Distal angle (Nd). 17) Proximal angle (Np). 18) Double Angle (Dn). 20) Distal arc / angle (Nd / Ad). 21) Proximal arc / angle (Ap / Np). 22) Random (AC). The above patterns can be ulnar and radial. Proposed by Shpak L.Yu. (2003) the classification has been improved and expanded by the author by adding new types of patterns, namely: «Combined linear (LS)», «wave / direct (Vs)», «distal arc / direct (Ads)» and «proximal straight arc (Aps)», «distal arc / slope (AdL)» and «proximal arc direct (ApL)», that, in turn, they can also be ulnar and radially oriented. Indicators of growth of the subjects were divided into three categories, namely: 1. Persons of low growth (150-160 cm) 2. Persons of average height (160-170 cm). 3 Persons of high growth (more than 170cm).

The statistical analysis of the results obtained was established for persons of the female gender group, of low height (150-160 cm), which are part of the Hutsul ethnic group, the Spearman Rank Order Correlation coefficient between the dermatological parameters that occur on the middle phalanges of the right and the left hand and height (150-160cm) shows that the main features that correlate with growth are: MF4leftHdu 0.91, MF3leftApLr 0.91, MF5leftLu -0.74. MF5RightLr -0.76, MF2RightS -0.76. (Fig.1). The main features that correlate with the growth in the proximal phalanges of the fingers in the above-mentioned group of individuals are: PF3LeftS 0.91, PF5LeftS 0.91, PF4RightLu 0.76, PF4RightAhr -0.74. The Spearman correlation coefficient, which corresponds to an increase in the monotonicity between the variables Height / Hdu, Height / ApLr, Height / Lr, shows that with increasing height (in the range of 150-160cm), the frequency of observing these features increases on the middle phalanges of the fingers of both hands. Also, in the results obtained, the negative Spearman correlation coefficient is found, which in turn corresponds to a monotonous decrease between the variables Height / Lu, Height / S, that is, there is a tendency to decrease the frequency of occurrence of the sign with an increase in height. The level of statistical significance for the obtained results is  $p < .05000$ , which corresponds to a high level of significance.

Regarding the frequency of a specific dermatoglyphic parameter at the middle phalanges of the fingers of the hands of the persons of the female gender group of low growth (150-160 cm), which are part of the Hutsul ethno-territorial group, there is a rather high frequency of appearance of the sign of S on all fingers of the left hand - up to 20%. The same tendency is observed on the right hand, however, there is one difference - the sign S appears on the 2nd finger with a frequency of up to 40%. The dermatological parameters Lu and Lr are extremely common on all fingers, both left and right. So, on the 2nd and 5th fingers, the meeting reaches 40%. The incidence of this parameter for the other two phalanges is lower, but still prevails over other parameters. There is also a high incidence of dermatoglyphic parameters of the LR in the middle phalanges of the right arm, especially on the 4th and 5th fingers, which reaches up to 40%. The determining parameter for a given gender and ethno-group with a height ranging from 150 to 160 cm is LR, which amounts to 25% of all dermatological parameters on both hands.

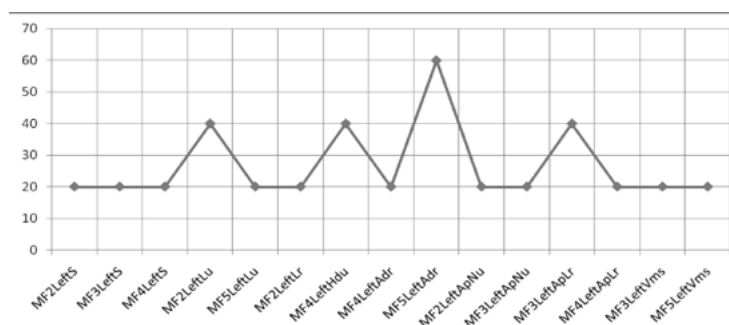
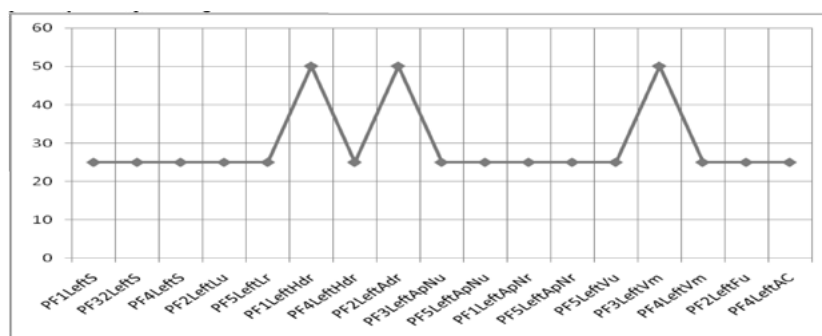


Fig. 1. Schedule of dependencies between height and frequency of signs on the middle phalanges of the left hand, (persons of the female gender group, of low growth (150-160 cm) that are part of the Hutsul ethno-territorial group)

In women of low stature (150-160cm) belonging to the Hutsul ethnosterior group on the proximal phalanges of the fingers, the following types of dermatoglyphic patterns are most commonly encountered: Lr, Lu, S.

For persons of the female gender group, of low growth (150-160 cm), which are part of the Boyko ethno-territorial group, the Spearman Rank Order Correlation coefficient between the dermatological parameters found on the middle phalanges of the right and left hands and the height of 150-160 cm shows that the main features that correlate with growth are: MF5LeftLu -0.94, MF2RightLr -0.81, MF3RightLr -0.81, MF4RightLr -0.81, MF5RightApNr -0.81, MF5RightLr 0.94. Regarding proximal phalanges, the following regularities are found: PF3LeftLu 0.89, PF3RightApNr -0.72, PF4LeftApNr -0.72, PF2LeftHdu 0.72. In this group of individuals there is a high ApNr response rate that reaches 70% on the third left hand and Lr reaches up to 50% on the 5 th left and right fingers.

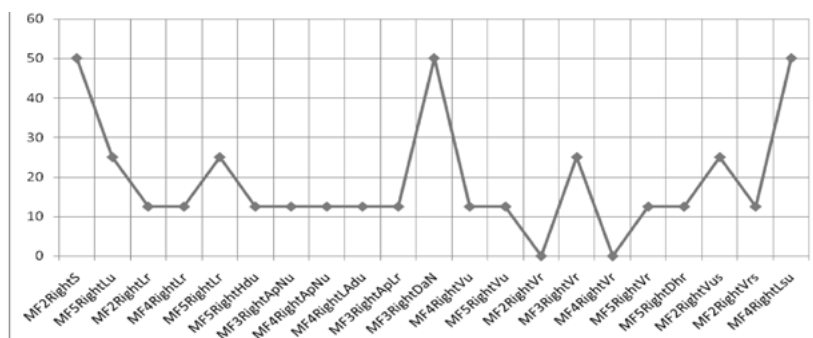
Among persons of the female gender group, of low height (150-160 cm), which are part of the Lemko ethno-territorial group, the Spearman Rank Order Correlation coefficient between the dermatological parameters found on the middle phalanges of the right and left hands and the height of 150-160 cm shows that the main features that correlate with growth are: MF4RightVrs 0.74, MF2RightAC 0.74, MF3RightLsu 0.74. And on proximal phalanges, the main features that correlate with growth are: PF2RightVr 0.57, PF5LeftVu -0.57, PF1LeftS 0.60 (Figure 2). In this group of individuals there is a high ApNr response rate that reaches 70% on the third left hand and Lr reaches up to 50% on the 5th left and right fingers. Regarding the category of persons of the female gender group determined by such a criterion as the variation of growth in the range of 160-170 cm, that is, persons of average height, after carrying out a series of statistical studies, we obtained the following results: in the persons of the Hutsul ethno-territorial group, the Spearman rank correlation coefficient is: MF3RightVr -0.72, MF4RightLdu -0.72, MF3LeftHdr 0.72, MF5RightLr 0.74, MF3RightDaN 0.74, revealed a high rate of occurrence of S, Ndu and Lu., Occurring with frequency up to 37%, respectively, on the 2nd, 4th, 5th fingers of the left hand. In women of Boyko ethno-territorial group, the Spearman correlation coefficient shows that the main features that correlate with growth are MF3LeftApNr -0.73, MF5LeftApLu 0.74 on middle phalanges (Fig.3) and PF1LeftLr 0.58, PF3RightLu -0.59, PF4LeftApLu -0.48 on paroxysmal phalanges.



**Fig. 2. Schedule of dependencies between height and frequency of appearance of signs on the proximal phalanges of the left hand (persons of the female gender group, of low growth (150-160 cm), which are part of the Lemko ethno-territorial group).**

It was also found that the most common dermatological parameters such as S, DaN, Vr, with frequency up to 50% on the 2nd, 3rd fingers of the right hand. For individuals of the Lemko ethno-territorial group, the Spearman correlation coefficient shows that the main features that correlate with growth are MF3LeftApNr -0.73, MF2RightAC -0.70 on average phalanges and PF4LeftVm -0.76, PF3LeftLu 0.77, PF5RightHdr 0.76 on proximal phalanges. It was also found that the most common dermatological parameters such as S, ApNr, Lu, with a frequency of 25% to 50% on the fingers of both hands.

In the persons of the female gender group, of high height (170-180 cm), which are part of the Hutsul ethno-territorial group, the Spearman rank correlation coefficient shows that the main features that occur on the middle phalanges and correlate with growth are: MF4LeftDaN -0.79, MF4LeftApLu 0,79, MF2LeftLu 0.79, MF3RightApNu -0.78, MF5LeftDaN 0.78. With regard to proximal phalanges, the defining correlations are: PF3LeftLu 0.89, PF3RightApNr -0.72, PF4LeftApNr -0.72, PF2LeftHdu 0.72. In this group of individuals there is a high incidence of S, Lu, DaN, reaching up to 60% on both hands. Concerning the Boyko ethno-territorial group, the Spearman rank correlation coefficient shows that the main features that correlate with growth are: MF4RightS -0.88, MF3RightApLu 0.72, MF3LeftApNsr -0.72, MF3LeftApNu 0.74 on medium phalanges and PF3LeftS 0.91, PF5LeftS 0.91, PF4RightLu 0.76, PF4RightAhr -0.74 on proximal phalanges. In this group of individuals, among the dermatological parameters most commonly found Lu up to 80% on the left hand, and Lr up to 60% on the right hand. In persons of the female gender group, of high height (170-180 cm), which are part of the Lemko ethno-territorial group, the Spearman's correlation coefficient shows that the main features that correlate with growth are: MF2RightAC -0.70, F2RightHdr 0.78, MF2RightS -0,70 non-average phalanxes and PF1LeftLr 0.58, PF3RightLu -0.59, PF4LeftApLu -0.48 on proximal phalanges. Often in this group of individuals there is Hdr, ApNr.



**Fig. 3. Schedule of dependencies between height and frequency of signs on the middle phalanges of the left hand (persons of the female gender group, average height (160-170 cm), which are part of the Boyko ethno-territorial group)**

The study of stable correlations between anthropometric and dermatological parameters allows us to widely apply the dermatological method in predicting external recognition features of an unknown person. Earlier, the dermatological method of identification allowed to identify a fingerprint to a particular person only if its dermatological parameters were known to the researcher (contained in the database). At the present stage of our study, it can be said with certainty that the dermatological method also allows to predict ethnorrassic (territorial) affiliation, skin color, individual growth, and other anthropometric and anthroposcopic parameters of an unknown person.

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## МОЖЛИВОСТІ ВИКОРИСТАННЯ ФАКТОРНИХ КРИТЕРІЇВ ДЕРМАТОГЛІФІЧНИХ ПАРАМЕТРІВ СЕРЕДНІХ ТА ПРОКСИМАЛЬНИХ ФАЛАНГ ПАЛЬЦІВ РУК ПРИ ПРОГНОЗУВАННІ ЗРОСТУ НЕВІДОМОЇ ОСОБИ

Коцюбинська Ю.З.

**Резюме.** У запропонованій статті описані стійкі корелятивні зв'язки між типом і частотою зустрічання дерматогліфічних параметрів середніх та проксимальних фаланг пальців рук та зростом особи, а також відображена можливість використання описаних зв'язків при прогнозуванні загальних фенотипічних ознак невідомої особи.

**Ключові слова.** Ідентифікація особи, дерматогліфічні параметри, коефіцієнт кореляції Спірмена.

## ВОЗМОЖНОСТИ ИСПОЛЬЗОВАНИЯ ФАКТОРНЫХ КРИТЕРИЕВ ДЕРМАТОГЛИФИЧЕСКИХ ПАРАМЕТРОВ СРЕДНИХ И ПРОКСИМАЛЬНЫХ ФАЛАНГ ПАЛЬЦЕВ РУК ПРИ ПРОГНОЗИРОВАНИИ РОСТА НЕИЗВЕСТНОГО ЧЕЛОВЕКА

Коцюбинская Ю. З.

**Резюме.** В представленной статье описаны стойкие коррелятивные связи между типом и частотой встречаемости дерматоглифических параметров средних и проксимальных фаланг пальцев рук и ростом человека, а также отражена возможность использования описанных связей при прогнозировании общих фенотипических признаков неизвестного человека.

**Ключевые слова.** Идентификация лица, дерматоглифические параметры, коэффициент корреляции Спирмена.

УДК 615:658-23/72

## АУТОЕРОТИЧНА СМЕРТЬ ВНАСЛІДОК КОМПРЕСІЙНОЇ АСФІКСІЇ В ПОЄДНАННІ З СТРАНГУЛЯЦІЄЮ

©Данилюк М. В.<sup>1</sup>, Зозуля В. М.<sup>1</sup>, Чуйко О. В.<sup>1</sup>, Ганський О. В.<sup>2</sup>,  
Лесик В. В.<sup>2</sup>

Обласне бюро судово-медичної експертизи Житомирської обласної ради<sup>1</sup>  
Житомирський науково-дослідний експертно-криміналістичний центр  
УМВС України<sup>2</sup>

**Резюме.** В статті наведений випадок з практики, що стосувався судово-медичної експертизи аутоеротичної смерті, викликаної незвичайною чи ризикованою сексуальною практикою наодинці. Смерть була зумовлена удушенням і постуральною асфіксією – від фатальної нестачі кисню, яка виникає коли людина підвішує себе, душить чи стискає собі горло під час мастурбації. Слід зазначити, що в деяких випадках ознаки аутоеротичної смерті своєчасно не розпізнають і плутають її з самогубством.

**Ключові слова:** аутоеротична смерть, асфіксіофілія.

**ВСТУП.** Аутоасфіксіофілія (еротична асфіксія) – форма аномальної сексуальної активності, пов'язана з використанням засобів, що обмежують доступ кисню до легень та головного мозку для посилення відчуттів, пов'язаних з сексуальним розвантаженням. Є досить небезпечною практикою, оскільки може призвести до втрати свідомості і знерухомлення особи [1]. Як правило, асфіксіофіл приховує свої заняття від інших, навіть від самих близьких людей, тому про наявність даного відхилення стає відомо лише у випадках, коли така активність призводить до смерті [2,3].

Наводимо приклад аутоеротичної смерті в результаті компресійної асфіксії в поєднанні з странгуляцією.

### РЕЗУЛЬТАТИ ДОСЛІДЖЕННЯ ТА ЇХ ОБГОВОРЕННЯ

24.03.2017 року за власною адресою в замкненій квартирі батьком БУВ виявлений труп гр. Р., 1985 р.н.

З протоколу місця події: «Середня частина кімнати обладнана спортивним снарядами типу турніка. Вказаний снаряд змонтовано з металевих труб діаметром 7см. Основні елементи снаряду представлені двома трубами, які закріплені металевими пластинами до підлоги та стелі кімнати. До металевій опорі вищеописаного снаряду на білому шнурку, який огортає вертикальну опору металевій конструкції подвійним одворотом закріплене металеве кільце, половина якого має пластмасову обгортку червоного кольору в положенні напівприсівши в