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Dermatoglyphics of Bulgarian Females — Finger and Palm Ridge Count

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The aim of the present study is to characterize the finger and palm ridge count on both hands of representative excerpt in healthy Bulgarian women. Subject of the study are the dermatoglyphic prints taken from both hands of 1270 Bulgarian females from 116 settlements in the country. Descendent formulae about ridge count of fingers and palm interdigital areas are elaborated. The investigated individuals are distributed according to the summed finger and summed palm ridge count, and according to the total finger and total palm ridge count. The results presented in this work complement the entire dermatoglyphic characterization of the Bulgarian population and could be used as a norm in the dermatoglyphic investigations of patients with different inborn and inherited diseases.

Key words: dermatoglyphics, finger ridge count, palm ridge count, Bulgarian women.

Introduction

The finger and palm ridge count is a quantitative dermatoglyphic feature. In Bulgaria exist data only about finger and palm ridge count of healthy individuals from Northeast Bulgaria [5] and about some control groups of healthy persons when patients suffering from different diseases were investigated [6, 7]. That's why, in the elaboration of the National program "Anthropological characterization of the Bulgarian population" realized in the Department of "Anthropology" in IEMAM, BAS, a dermatoglyphic study of the population was carried out, as well.

The aim of the present study is to characterize the finger and palm ridge count on both hands of representative excerpt in healthy Bulgarian women.

The results about ridge count of healthy Bulgarian men are presented in separate paper [4].

Material and Methods

Object of the study are the dermatoglyphic prints for both hands of 1270 healthy women from 116 settlements in the country. The finger and palm ridge count is

elaborated according to the methods of P e n r o s e [2] and H o l t [1]. Variation statistical analysis is applied too, and for the bilateral differences is used the t-criterion of Student at $P < 0.05$.

Results and Discussion

Finger ridge count. The highest mean ridge count is established for I digit on right hand, and the lowest — for II digit on left hand (Table 1). The descendent formula for right hand is I > IV > V > III > II. For the left hand the first and second positions exchange themselves, but the ridge count difference is only 0.21 — IV > I > V > III > II. The results obtained correspond to the high frequency of whorls and loops on the I and IV digits, as well as, to the high frequency of arches on the II one [3]. The mean ridge count is higher on each finger in right. Statistically significant is the bilateral difference about I, II and IV digits ($P < 0.05$).

The mean summed ridge count in the right hand is considerably higher compared to the left hand ($t = 4.11$) ($P < 0.01$). Higher is the summed ridge count in right at 63.6% of the females, and in left — at 31.7% of them, while lowest is the per cent (4.6%) of women having equal summed ridge count on both hands. The results obtained correspond to those published by Holt for 240 females — 66.7%, 28.3% and 5.0% respectively [1].

T a b l e 1. Statistical parameters of the ridge count on single fingers and Total ridge count in Bulgarian females

Statistics	Right hand						Left hand						Total both hands
	I	II	III	IV	V	I-V	I	II	III	IV	V	I-V	I-X
n	1184	1220	1234	1228	1229	1113	1227	1207	1226	1204	1201	1115	1012
$\bar{x}$	15.99	11.07	11.22	14.98	11.85	64.78	14.01	10.37	10.76	14.22	11.53	60.67	125.52
S	5.85	6.73	5.76	5.82	5.21	23.22	5.92	6.83	6.20	5.90	5.04	24.09	46.58
Sx	0.17	0.19	0.16	0.17	0.15	0.70	0.17	0.20	0.18	0.17	0.14	0.72	1.46
v	36.58	60.79	51.30	38.85	43.97	35.84	42.26	65.86	57.62	41.49	43.71	39.71	37.11
min	0	0	0	0	0	0	0	0	0	0	0	0	0
max	30	29	27	30	28	122	31	32	29	28	26	116	237

The distribution of women after the summed ridge count on I-V digit shows that most are the females who have ridges from 71 till 80 ones in right, a distribution that doesn't tally with the calculated mean value ($x - 64.78 \pm 0.70$), which falls in the previous interval 61-70 ridges. In left again most are the women having summed ridge count of I-V digit in the interval 71-80 ridges, but the mean value falls nearly to the initial limit of the previous interval ($x - 60.67 \pm 0.72$). The frequency distribution of summed ridge count is moved in left, i.e. negatively skewed for both hands. The non-normality is better expressed in the left hand compared with the right one (Fig. 1).

The Total finger ridge count in both hands (TFRC) for the investigated females is 125.52 ± 1.46. The distribution of the individuals is again asymmetrical, moved in left. Most are the cases into the interval 141-160 ridges, which don't tally with the mean value for TFRC (Fig. 2).

Similar are the results presented by H o l t [1] from a study held out in 1955 about 825 women from England and by K a r e v [5] in 1979 about 1065 Bulgarian females from Northeast Bulgaria. The negative skewness in the frequency distribution is accepted by H o l t as an indicator for the influence of comparatively small genes number over TFRC determination. In the case when big number of genes has

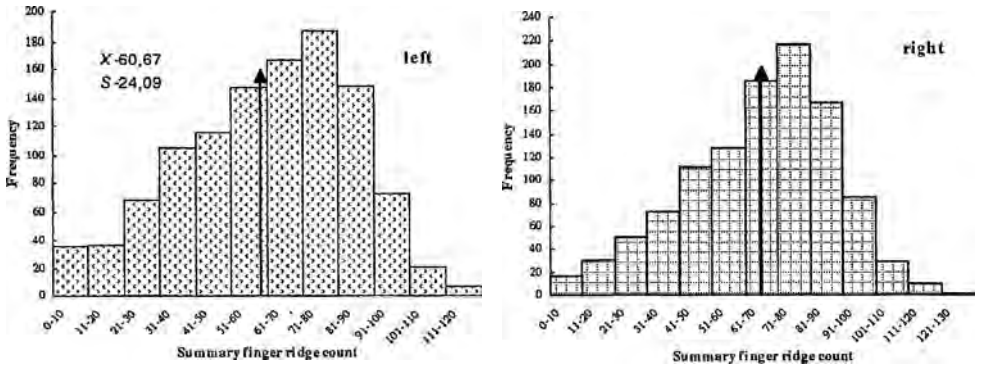

Fig. 1. Distribution of the individuals according to their summary finger ridge count

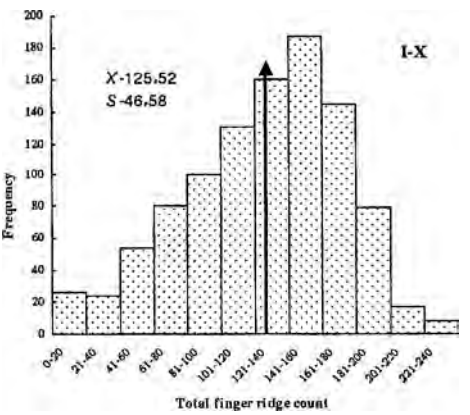

Fig. 2. Distribution of the individuals according to their Total finger ridge count

an appreciable effect on the TFRC determination, the curve of frequency distribution had to be similar to the Gaussian one [1].

Palmar ridge count. Richest of papillary ridges on both hands is the II Interdigital Area (IA) (between finger triradii ***a*** and ***b***), followed in descendent order by IV IA (***c-d***) and III IA (***b-c***). The mean ridge count ***a-b*** is higher for the left hand compared to the right one, while vice versa the ridge count ***c-d*** is in favor for the right hand. Both differences are statistically significant at $P < 0.05$ (Table 2).

T a b l e 2. Statistical parameters of the palmar interdigital ridge count and Total ridge count in Bulgarian females

Statistics	Right hand				Left hand				Total both hands
	a-b	b-c	c-d	a-d	a-b	b-c	c-d	a-d	a-d
n	1178	1129	1128	1084	1184	1108	1097	1061	997
x	36.14	24.75	33.98	95.22	37.12	24.91	33.32	95.61	191.70
S	5.66	5.37	5.76	12.79	5.50	5.23	5.77	12.45	24.18
Sx	0.16	0.16	0.17	0.39	0.16	0.16	0.17	0.38	0.77
v	15.66	21.70	16.95	13.43	14.82	21.00	17.32	13.02	12.61
min	18	8	11	57	17	9	13	60	124
max	61	40	51	140	60	44	50	143	282

The summed ridge count for the three IA in right ***a-d*** vary from 57 till 140 ridges, and in left — from 60 till 143 ridges. The mean values are respectively 95.22 ± 0.39 for the right hand and 95.61 ± 0.38 for the left one. The difference is very small (0.39) and not significant statistically, but yet it exerts probably an influence on the percentage distribution of the individuals according to the ridge count for both hands separately. Equal ridge count for both hands have 5.8% of the women, by 49.3% the ridge count is higher in left, and by 44.8% - in right.

The distribution of females after the summed ridge count ***a-d*** shows that most of them fall into the interval of 91-100 ridges on both hands. These results coincide with the established mean values. The frequency distribution of the summed palmar ridge count is nearly symmetrical in contrast to those of the summed finger ridge count (Fig. 3).

The mean value of Total palmar ridge count (TPRC) for both hands is 191.70 ± 0.77. The minimal TPRC is 124 ridges and the maximal one is 282 ridges. The frequency distribution of the women according to their TPRC is nearly symmetrical, slightly moved in left (Fig. 4).

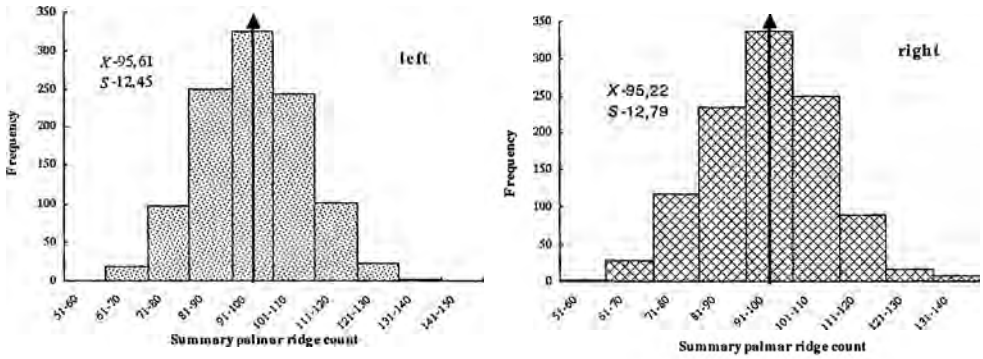

Fig. 3. Distribution of the individuals according to their summary palmar ridge count

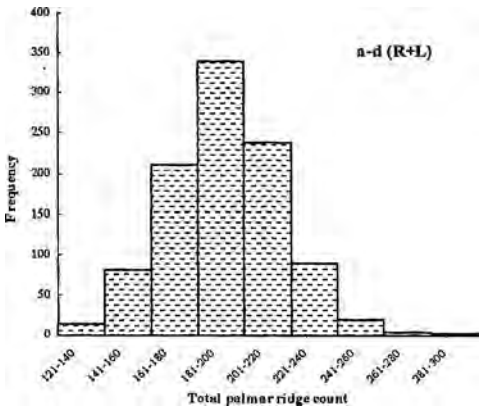

Fig. 4. Distribution of the individuals according to their Total palmar ridge count

Conclusion

The data in present investigation complement the results of previous studies about other dermatoglyphic features in representative excerpt of Bulgarian males and females published by us, being an important contribution to the complete notion about dermatoglyphic status of the Bulgarian population. At the same time they could be used as a norm in the clinical and medico-anthropological studies with theoretical and scientific applied purpose.

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