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PALM DERMATOGLYPHICS OF THE CZECHS FROM THE SOUTH MORAVIAN REGION (CZECHOSLOVAKIA)

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Distribution of the palm dermatoglyphics within The Moravian population has been studied by several authors. Thus Holomek (1949) reported data concerning the palm dermatoglyphics of 165 Czech males and 70 females coming from various districts of Moravia. Ten years later Pospíšil (1959) in his paper gave distribution of palm dermatoglyphics of the Silesians (180 males and 138 females) from Hlučín. Crhák and Crháková (1965) dealt in detail with palm dermatoglyphics of inhabitants of the town of Opava (284 males and 248 females) and finally Crhák (1966) reported on dermatoglyphical picture of old settlers of the two typical villages of Náměšť/H and Senica/H in Haná (180 males and 174 females).

As shown above, the aim of most these studies was to light some dermatoglyphical relations within relatively isolated ethnic groups living in the northern part of Moravia—the Silesians and the inhabitants of the region of Haná. There is no study dealing with the distribution of palm dermatoglyphics concerning a larger population from Moravia, especially that from the southern part of this country. For this reason the research of dermatoglyphics of the Czechs from Moravia was started. This paper refers to the palm dermatoglyphics of the Czechs coming from the South Moravian region. Their frequencies of finger dermatoglyphical types and total ridge count have been reported elsewhere (Beneš, Indrová 1973).

MATERIAL AND METHODS

The subjects studied are persons (460 males and 472 females) coming from towns and villages of the South Moravia region. Their age ranged from 7 to 46 years; majority belonging to the age interval between 25 and 35 years. All were born in the South Moravia region and were unrelated together.

The palm prints have been analysed and formulated basically according to the procedures advocated by Cummins and Midlo (1961) and Penrose (1968), though some variations have been adopted.

RESULTS

Main Line Analysis

Table 1 and 2 give the terminations of main lines *D*, *C*, *B* and *A* on palms of 460 Czech males and 472 Czech females.

TAB. 1

Percent frequencies of terminations of palmar main lines (D, C, B and A) in 460 Czech males

Positions	Line D		Line C		Line B		Line A	
	R	L	R	L	R	L	R	L
1							3.6	12.2
2							0.3	0.9
3					0.6	0.3	17.2	24.4
3h							5.1	7.4
4							2.6	8.6
5′					8.2	8.2	53.4	36.7
5			1.6	5.3	13.2	28.7	16.2	9.2
5″			4.3	5.9	10.2	15.5	1.3	0.3
6			3.3	1.3	4.0	5.6	0.3	0.3
7	8.6	16.2	12.8	32.3	58.8	31.2		
8	5.3	0.6			3.0	9.9		
9	20.1	33.7	60.3	32.2	2.0	0.3		
10	3.6	6.9	3.6	0.3				
11	62.4	42.6	1.3					
X			9.2	16.8				
0			3.6	5.9		0.3		

TAB. 2

Percent frequencies of terminations of palmar main lines (D, C, B and A) in 472 Czech females

Positions	Line D		Line C		Line B		Line A	
	R	L	R	L	R	L	R	L
1							4.6	15.2
2							2.6	0.9
3							17.9	26.4
3h							9.1	6.2
4							3.4	2.8
5′					8.9	14.5	51.8	44.6
5			3.3	8.6	22.4	38.6	9.3	3.3
5″			9.6	12.3	9.9	9.6	1.3	0.6
6			1.6	1.3	8.2	2.6		
7	14.3	24.6	21.4	30.0	47.0	34.4		
8	2.3	2.0			1.3			
9	26.6	33.0	46.2	30.4	2.3	0.3		
10	7.4	3.8	2.0					
11	49.4	36.6	2.0					
X			7.3	8.2				
0			6.6	9.2				

D-line. Position 11 is the most frequent termination of D-line, followed by the positions 9 and 7 on both the hands in both sexes. Cummins' modal type of *D*-line is as follows: males 11 (56.0 %), 9 (32.2 %), 7 (14.3 %) and females 11 (43 %), 9 (35.5 %), 7 (21.5 %). As can be seen in tables 1 and 2 the right and left hands differ in termination of this line. There is a clear tendency for termination of D-line to be higher on the right hands.

C-line terminates from 5 to 11 positions. The largest frequencies of these terminations being in position 9 in both sexes. Among males the terminations of *C*-line are almost twice as frequent on rights as on lefts, whereas among females the ratio of right to left terminations at position 9 is approximately 3 to 2. Various forms of abortative line *C* ending (incomplete—*X* or missing—*O*) occur relatively often. Main line *C* is absent from approximately 5 to 8 per cent incomplete from 8 to 13 per cent of palms in both sexes.

B-line has the highest frequency of its termination in position 7 in both sexes. Bimanual asymetry—the position 7 is more frequent in the right hand than in the left one—is shown in both sexes but is more conspicuous in males than females.

A-line usually runs obliquely across the palm terminating in the position 5'. The transversality of the ridges is also reflected by this line where 53 per cent of the males' sample end in the position 5' on the right hands, but only 36 per cent on the left ones. Approximately the same could be seen in females' sample. The position 3h, where the main line A recurves into the palmar surface forming a part of hypothenar patterns occurs relatively seldom in both sexes.

TAB. 3

The Cummins' Main-line Index (MLI) and Valšík's Papillary Number (PN)

	Right hand		Left hand	
	MLI	PN	MLI	PN
Males	10.6	29.4	9.5	27.3
Females	9.8	28.0	8.5	26.1

Table 3 gives values of Cummins' Main-line Index (MLI) and Valšík's Papillary Number (PN) of the Czech sample. There is nothing noteworthy in the findings beyond the fact that the Czechs from the South Moravia region conform to the trend in other populations with regard to bilateral and sexual differencies. Both these differencies could be formulated as followes: There is tendency to higher terminations of the main lines D, C, B and A on the right palm than the left one, and a tendency to higher termination of those on both the palms in males than in females.

Axial Triradii

Frequencies of types and combinations of axial triradii in Czech males and Czech females are shown in table 4. It is observed that the axial triradii are distributed much the same way in both the hands in both sexes. Triradius t is found to be most frequent, followed by triradius t'and finally t''. These triradii occur separately or in combinations. As shown on table 4 occurrences of two or three axial triradii in one hand are seldom observed. Marginal triradii have not been studied.

TAB. 4

Percent frequencies of types and combinations of axial triradii in 460 Czech males and 472 Czech females

Axial triradius	Males		Females	
	R	L	R	L
t	59.8	65.9	58.8	58.8
t'	16.6	17.9	23.1	22.9
t''	4.5	3.6	3.7	4.7
tt	—	0.2	0.7	0.7
tt'	8.3	5.7	4.9	4.3
tt''	7.5	5.4	6.1	6.9
t't''	—	0.2	—	0.3
tt't''	0.5	0.2	0.3	0.3
(0 or t?)	2.8	0.9	2.4	1.1

Configurational Areas

TAB. 5

Percent frequencies of hypothenar patterns in 460 Czech males and 472 Czech females

Pattern	Males		Females	
	R	L	R	L
A^u	37.7	45.2	39.6	39.6
A^c	0.6	1.3	1.5	2.6
A^r	2.0	1.0	3.3	1.3
A^u/A^c	15.9	6.3	11.2	6.3
A^u/A^r	—	—	—	0.6
V	0.3	1.0	—	0.3
A^u/V	—	0.3	—	—
V/A^u	13.2	12.9	9.2	14.5
V/A^c	0.6	1.0	0.3	2.0
T^u	—	—	0.3	—
T^r	—	—	0.3	—
L^r	6.6	6.3	4.6	4.3
L^u	2.3	2.6	2.0	2.6
L^c	1.3	1.6	2.6	0.3
A^u/L^u	0.3	1.3	1.0	1.3
A^u/L^c	—	—	—	0.3
L^r/A^u	4.6	8.9	13.2	14.5
L^r/A^c	4.0	3.0	4.6	2.0
L^r/A^r	0.3	—	—	—
L^u/A^u	0.3	1.0	0.3	1.6
L^u/A^c	1.3	0.3	0.6	1.0
L^c/A^u	3.0	0.6	—	—
W	2.0	1.0	1.3	—
W/A^u	—	—	0.3	0.3
W/L^u	—	—	—	0.3
L^r/V	—	1.3	—	—
V/L^r	1.0	0.6	—	0.3
V/L^u	2.0	—	1.3	—
L^r/L^r	—	—	—	0.3
L^r/L^u	0.3	1.6	0.6	1.6
L^r/L^c	0.3	—	—	—
L^u/L^u	—	—	—	0.3
L^u/L^c	—	—	—	0.3
L^c/L^r	—	—	—	0.3
L^c/L^u	0.3	—	0.6	0.6
S	0.3	0.9	1.3	0.6

Palmar patterns and vestiges on the five palmar areas—the hypothenar, the thenar and the first interdigital area and the interdigital areas II, III and IV—have been analysed.

Hypothenar. The list of hypothenar patterns and vestiges is shown in table 5. It is found that true patterns approximatelly in 31 per cent in males and 34 per cent in females are frequent. From the true patterns radial loops are to be dominated, followed by ulnar and carpal loops. Whorls and tented arches are found to be rarely frequent. These patterns are very often combined by arches or vestiges, rarely by open fields.

Thenar/I interdigital (Table 6). These two areas show extremely low incidence of true patterns (10,4 per cent in males and 9,9 per cent in females). The true patterns are almost of type loop (the carpal type—O/L or the radial type—L/O), while tented arches and whorls occur very seldom. With regard to the true patterns there is a relatively large occurrence of cases, where loops are combined by vestiges. Bettman configuration (L/Q/L) is found to be relatively often.

Interdigital area II, III and IV (Table 7). The configurations of these areas are true patterns (loops of L or D type, and whorls), vestiges and open fields including the special forms of open fields known as a multiplication.

The distribution of patterns is different in these areas. The greatest number of patterns occurs in the interdigital IV, followed by interdigitals III and II. In interdigitals II and III loops are found to be prevalent. There are associated to a high degree with accessory triradii. The fourth area bears usually loops of type L. There are only few loops of type D or whorls here. If the interdigital II and III have only single patterns, the interdigital IV bears a great number of combined ones.

TAB. 6

Percent frequencies of thenar/I patterns in 460 Czech males and 472 Czech females

Pattern	Males		Females	
	R	L	R	L
O	91.3	82.0	90.4	84.9
V	2.3	3.3	0.9	3.0
O/L	1.3	0.6	1.0	1.6
V/L	0.3	0.6	1.6	2.0
L/O	1.3	3.0	0.6	1.0
L/V	0.6	1.6	2.6	3.6
B(L/Q/L)	2.6	7.9	2.6	3.0
L/W	0.3	1.0	0.3	0.6
W/L	—	—	—	0.3

TAB. 7

Percent frequencies of II, III and IV interdigital patterns in 460 Czech males and 472 Czech females

Pattern		Males		Females	
		R	L	R	L
II	O	88.4	95.1	95.1	98.4
	V	4.3	0.6	1.3	—
	d	—	0.3	—	—
	D	7.3	4.0	3.6	1.6
III	O	46.9	71.3	50.9	70.4
	V	2.6	1.3	2.6	2.0
	l	3.6	7.6	6.9	9.2
	L	45.9	19.5	38.3	17.8
	d	—	0.3	—	—
	D	1.0	—	1.3	0.6
IV	O	59.0	44.2	54.5	43.9
	V	3.0	6.3	4.0	6.3
	l	1.6	5.3	3.3	5.6
	L	26.7	25.1	27.1	29.7
	d	0.6	2.0	0.3	0.3
	D	7.9	9.9	10.2	10.9
	W	—	—	0.3	0.3
	L/V	—	2.0	—	0.6
	d/l	—	—	0.3	0.3
	V/L	0.3	0.3	—	0.3
	l/L	—	—	—	0.3
	l/d	—	—	—	0.3
	V/D	—	—	—	0.3
	l/D	—	1.6	—	0.3
	L/D	0.3	3.0	—	0.6
	L/W	—	0.3	—	—

TABLE 8

Percent frequencies of the true patterns in palmar configuration areas of the Czechs (460 males. 472 females) according to sex and site

Interdigital area	Right hands			Left hands		
	II	III	IV	IV	III	II
Males	7.2	50.5	36.1	49.2	24.6	4.5
Females	3.7	48.5	41.0	50.4	27.8	1.5
	Hypothenar Thenar/I			Hypothenar Thenar/I		
Males	29.7		5.5	14.2		31.0
Females	36.0		9.5	12.5		35.0

The usual trends of pattern frequency towards bilateral asymetry are clearly evident, except on the hypothenar and the second interdigital. The table 8, where the data concerning the frequencies of true patterns in five palmar areas are collected, shows that third interdigital patterns have higher frequency in the right hands, while the thenar/I and the fourth interdigital patterns are more common in the left hands. There are no outstanding differencies between males and females.

DISCUSSION

Main-line terminations and frequencies of pattern types in the palmar configurational areas vary widely among different populations (See table 9, Schwidetzky 1966, table 2, Gladkova 1966, tables 21, 22). These variations, however, are mostly limited by geographical positions of populations, their racial composition and other factors.

TAB. 9

Termination of D-line and distribution of patterns on palm among the Czechs and some other Europaen populations

Population	Author	N	Termination			Hypothenar	Thenar/I	II	III	IV
			7	9	11					
Czechs — Silesians (Hlučín)	Pospíšil 1959	181 ♂ + 138 ♀	12.7	38.9	48.4	35.2	19.0	3.1	42.6	51.4
Czechs — Silesians (Opava)	Crhák, Crháková 1965	284 ♂ + 248 ♀	—	—	—	35.3	5.9	—	—	—
Czechs (Olomouc)	Hajn 1964	210 ♂ + 227 ♀	15.1	37.8	47.1	—	—	—	—	—
Czechs (Náměšť, Senice)	Crhák 1966	180 ♂ + 174 ♀	—	—	—	39.5	6.2	5.2	36.9	48.2
Czechs (Brno)	Holomek 1948	165 ♂ + 70 ♀	14.6	39.5	45.9	33.5	5.7	—	—	—
Czechs (the South Moravia region)	present study	460 ♂ + 472 ♀	17.9	33.8	48.3	31.7	11.2	4.2	38.0	44.1
Czechs (Bohemia and Moravia)	Malá 1961	500 ♂ + 500 ♀	17.8	39.8	42.4	33.9	6.1	4.7	49.7	45.5
Slovaks — Slovakia (Horehronie)	Pospíšil 1963	150 ♂ + 136 ♀	14.5	37.9	47.6	38.6	12.8	6.4	45.5	59.9
Slovaks — all reions of Slovakia	Pospíšil 1971	200 ♂ + 200 ♀	13.3	39.2	47.5	39.7	14.2	7.3	43.3	56.0
Lusatian Serbs (Germany)	Lorencová, Beneš 1965	100 ♂ + 98 ♀	16.4	38.8	44.8	41.3	9.0	2.2	29.7	37.5
Poles (Poland)	Lasiński 1952	580 ♂	11.8	41.1	47.9	33.8	7.8	7.2	44.9	52.7

It has been found yet that there is relatively a high similarity in the dermatoglyphical relations within the Czech population (Pospíšil 1959, Crhák 1966, Beneš, Indrová 1973), nevertheless, some groups of Czech inhabitants especially old settlers from Haná seem to have slightly different distribution of palm dermatoglyphics (Crhák 1966). It is also known that the dermatoglyphical picture of the Czechs is much in keeping with their geographical localisation in the Central Europe. The following comparison will show whether the data obtained are conformed with those which we have on hand.

D-line termination (Cummins' method) of the Czechs from the South Moravia appears to be practically the same as that of the other Czechs' samples. Also with regard to the geopraphical neighbours (German, Poles, Slovaks, Lusitian Serbs) the Czechs are found to be in close position to them (Table 9, Schwidetzky table 2, Gladkova 1966, table 21). The only exception is a higher termination of D-line in the Hungarian sample (Malán 1940).

In the hypothenar area patterns are present between about 29.8 per cent (Germans) and 44.7 per cent (Basks) of Whites and are much less common in other races examined. The majority of the known European populations falls into the middle of this range including the majority of the Czechs' samples. Among the samples, however, there are significant differences. Thus the Czechs' samples show approximately the same frequency of hypothenar patterns as the Poles and the Hungarians, but they show lower frequency than those of the Slowaks, the Lusatian Serbs and than the majority of the Germans' samples.

As Schwidetzky (1962) pointed out, the pattern frequency on thenar/I fluctuates between 15 and 20 per cent in the most European populations. From the table 9 there is evident that the Czechs' data fall deep below this range. Only the Silesians from Hlučín (Pospíšil 1959), who are relatively isolated group, are found to be resembling many European populations. Thus a conclusion can be drown that the Czech population shows lower pattern frequency in thenar/I than that of other Europeans.

In conformity with the other authors the pattern frequency on the interdigital II in the Czechs is low and appears to be quite similar to that of other populations living in Europe, especially in Central Europe. Remaining configurational areas III and IV show in whites relatively high pattern frequencies. It is interesting to note, however, that in contradiction with variation in frequency of patterns on hypothenar and thenar/I there are considerable differencies in pattern incidence not only among populations but also within them. The Czech samples give the evidence for it. The table 9 shows the incidences of patterns in interdigital III and IV within the Czech population. It is observed that the incidences of patterns fluctuate on interdigital III between about 36.9—49.7 per cent and on interdigital IV between about 44.1—51.4 per cent. Something like that can be seen in the German population (See Schwidetzky 1962, table 4). As to the Poles and the Hungarians, both samples show close resemblance to the Czechs, while Lusitians Serbs appear to be different.

The comparison of terminations of palm main lines and pattern frequencies in palmar configurational areas demonstrates only partial dermatoglyphical relations within and among populations living in the North and Centre of Europe. According to the data available, however, the Czech population in conformity with its geographical position appears to

be an approximate dermatoglyphical centre in Europe. Nevertheless further research is needed in other population groups to obtain the entire dermatoglyphical picture in this part of Europe.

SUMMARY

A set of palm prints belonging to 460 Czech males and 472 Czech females from the South Moravian region (ČSSR) was studied. It is found that the system of palmar ridges of the Czechs has the following characteristic features:

1. Main lines *D*, *C*, *B* and *A* of males and females are terminated in high positions of hands. There is a clear tendency to higher terminations of these lines on the right hand than the left one. Cummins' modal formula for *D*-line is as follows: position 11 (48.3 per cent), 9 (33.8 per cent) and 7 (17.9 per cent).

2. The true patterns for hypothenar are 31.7 per cent, for thenar/I 11.2 per cent of the complete samples. Interdigital patterns are exhibited in 4.2 per cent (II), 38 per cent (III) and 44.1 per cent (IV).

3. There is similarity within the Czech population with respect to high terminations of palmar main lines, higher frequency of patterns in the hypothenar area and low frequency in the thenar/I area and in the second interdigital area, however, there are differencies in incidence of patterns on the III and IV interdigitals.

4. Comparison of the Czechs with their geographical neighbours shows similarity in terminations of main lines and in pattern frequencies in the hypothenar, II, III and IV interdigital areas. There are, however, striking differencies in pattern frequencies in the thenar/I area. The Czechs show conspicuous lower frequencies of patterns than those of the most neighbouring populations.

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