

A Morphological Study of Structural Relationships Between Cores and Triradii in Finger Dermatoglyphic Loop Patterns

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ABSTRACT For the present study, 182 Punjabi males and 155 Punjabi females are examined to study the structural relationships between cores and triradii in digital dermatoglyphic loop patterns. Structures of cores and triradii of loops are categorized separately into four types and zero to three value is assigned to these types. For each digit, Pearson's coefficient of correlation is calculated and Fisher's Z-test applied to test the null hypothesis. Results show a great dissimilarity between males and females with respect to some digits.

Dermatoglyphic studies have been carried out from the point of view of importance to human genetics. In the past, there are numerous qualitative and quantitative studies of finger dermatoglyphic pattern types and frequency reporting. Very few studies have been reported of structural relationships within digital patterns. The present investigation has been done to correlate the morphological characteristic of cores and triradii with loop configurations.

of the core was compared with the numerical value of the triradii within each loop. Pearson's coefficient of correlation *c.f.* Freund, 1979) was calculated for each digit of right and left hand and for both the sexes separately. Fisher's Z-test *c.f.* Freund, 1979) using formula $Z = 1/2 \log \frac{(1+R)}{(1-R)}$ to test the null hypothesis is applied, where R is Pearson's coefficient of correlation.

MATERIAL AND METHODS

The data consists of 337 unrelated Punjabi individuals (182 males and 155 females). Bilateral finger prints of each individual were taken using inked pad method as prescribed by Cummins and Midlo (1961). Different types of structures of cores and triradii of loops are assigned values 0-3. The configuration of the cores and their respective numerical values are illustrated in figure 1. The configuration of triradii and their numerical values are shown in figure 2, as prescribed by Penrose (1954). The numerical value

RESULTS AND DISCUSSION

The results for the males and females are summarised in table 1. From the results, it is quite clear that there is a positive linear relationship between the structural formations of cores and triradii in both the males and females. This positive linear relationship is highly significant for digits RI, RIII and R IV in males and RI, RIII, RIV, and LII, LIV in females. The Null hypothesis H_0 of a positive linear relationship can be accepted at all conceivable levels for all these digits in case of males and females. Unequal sample size is due to the unequal distribution of loop pattern on all the ten digits.

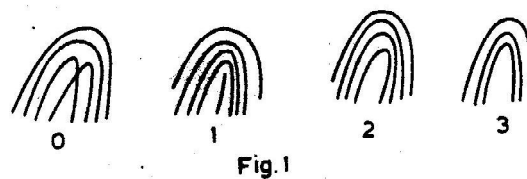


Fig. 1

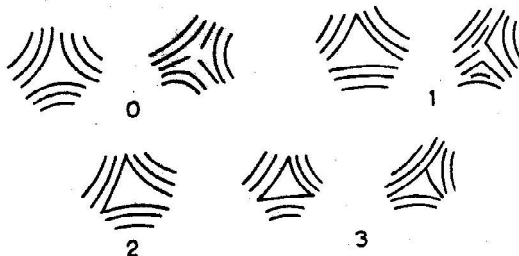


Fig. 2

Figs. 1, 2. Structural configurations of cores and triradii (Fig. 1) and corresponding numerical values (Fig. 2)

Table 1: Statistical relationships between the configurations of cores and triradii in Punjabi males and females

Digit	Sample size	Pearson's coefficient of correlation 'R'	Fisher's Z-test
<i>Male</i>			
R I	81	-0.5594*	0.3309
R II	73	-0.0575	1.0260
R III	127'	-0.2267*	0.7257
R IV	56	0.0936	1.3890
R V	125	0.3047*	2.1603
L I	92	-0.0680	1.0046
L II	86	-0.0862	0.9685
L III	117	0.0350	1.2348
L IV	67	0.1143	1.4484
L V	133	0.0186	1.1949
<i>Female</i>			
R I	97	-0.2246*	0.7289
R II	76	-0.1344	0.8784
R III	108	-0.6503*	0.2119
R IV	59	0.4860*	3.3284
R V	110	0.0522	1.2147
L I	87	-0.1147	0.9143
L II	80	-0.3499*	0.5545
L III	92	-0.0615	1.0178
L IV	66	-0.8796*	0.0737
L V	111	-0.1166	0.9108

* Significant at 5 per cent level

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The ABO and Rh (D) Blood Groups Among Five Caste Populations of Uttar Pradesh

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KEY WORDS Polymorphism. Blood Groups. Caste Groups. Uttar Pradesh.

ABSTRACT The occurrence of the ABO and Rh (D) blood groups among 5 caste populations of Uttar Pradesh has been reported. The distributions of these blood markers are in genetic equilibrium and well within the ranges observed for other North Indian populations.

This paper reports the incidence of the ABO and Rh (D) blood groups among 5 caste populations viz., the Brahmin, Bania, Rajput, Yadav and Scheduled Castes of Lucknow, Uttar Pradesh.

MATERIAL AND METHODS

Blood samples were randomly collected from a total of 2357 individuals belonging to 5 major caste groups of Lucknow (U.P.) viz., the Brahmin, Bania, Rajput, Yadav and Scheduled Castes. Typing for the ABO and Rh (D) blood groups was done using standard anti sera with proper controls. The gene frequencies for the ABO and Rh (D) blood groups were calculated after Yasuda (1984) and Mourant et al. (1976) respectively.

RESULTS AND DISCUSSION

Phenotypes and gene frequencies of the ABO and Rh (D) blood groups are presented in tables 1 and 2, respectively. The populations are in Hardy-Weinberg equilibrium for both the blood groups. It is observed that group A ranges from 19.50 to 26.54%, group B from 32.80 to 40.44%, group AB from 6.63 to 17.10% and group O from 24.55 to 31.30%. The Rh (D) negative varies from 1.34 to 7.04%.

The overall incidence of B group (38.60%) is followed by O (29.01%), A (22.40%) and AB (10.10%), and the gene frequencies ($A=0.178$, $B=0.283$, $O=0.539$) are well within the North Indian ranges (Mourant et al., 1976; Tills et al., 1983). Same is true for the Rh (D) negative groups (4.37%, $d=0.209$).

Table 1: Phenotypes and gene frequencies for the ABO blood groups in various caste populations of Uttar Pradesh

Population	Number tested	ABO Phenotypes				ABO gene frequencies		
		O	A	B	AB	A	B	O
Brahmin	497	122 (24.55)	109 (21.93)	201 (40.44)	65 (13.08)	0.192	0.316	0.492
Bania	754	236 (31.30)	147 (19.50)	309 (40.00)	62 (8.20)	0.150	0.288	0.562
Rajput	422	127 (30.10)	112 (26.54)	155 (36.72)	28 (6.63)	0.187	0.253	0.560
Yadav	385	120 (31.20)	88 (22.90)	146 (37.80)	31 (8.10)	0.170	0.267	0.563
Scheduled Castes	299	79 (26.42)	71 (23.74)	98 (32.80)	51 (17.10)	0.223	0.282	0.495
Total	2357	684 (29.01)	527 (22.40)	909 (38.60)	237 (10.10)	0.178	0.283	0.539

Figures in parentheses are percentages

Table 2: Phenotypes and gene frequencies of the Rh (D) blood groups in various caste populations of Uttar Pradesh

Popula- tion	Number tested	Rh (D) Phenotypes		Rh (D) gene frequencies	
		Rh(D)+ve	Rh(D)-ve	D	d
Brahmin	497	462(92.96)	35(7.04)	0.735	0.265
Bania	754	719(95.36)	35(4.64)	0.785	0.215
Rajput	422	401(85.02)	21(4.98)	0.777	0.223
Yadav	385	377(97.92)	08(2.08)	0.856	0.144
Scheduled Castes	299	295(98.67)	04(1.34)	0.884	0.116
Total	2357	2254(95.63)	103(4.37)	0.791	0.209

Figures in parentheses are percentages

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