

Study on Finger and Palmar Dermatoglyphics Among the Sunni Muslims of West Bengal

Jyoti Ratan Ghosh¹, Madhumati Chatterjee², Wasim Raja² and
Arup Ratan Bandyopadhyay²

¹ Department of Anthropology, PSV, Visva-Bharati, Birbhum, West Bengal, India

² Department of Anthropology, University of Calcutta, 35 Ballygunge Circular Road
Kolkata 700 019, West Bengal, India

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ABSTRACT Bilateral palm and fingerprints of 225 Sunni Muslim males of Howrah district, West Bengal, India were studied in the present cross-sectional study. Dermatoglyphic trait includes finger ball pattern, ridge counts and main line formula. The results revealed that among adult Sunni Muslim males, the overall frequency of whorl was higher followed by loop and arch. The mean TFRC was higher in right hand (99.16 ± 38.60) compared to left hand (67.64 ± 20.12). However, with regard to the AFRC, an inverse results has been observed, i.e. the mean AFRC was higher in left hand (98.84 ± 38.87) compared to right hand (68.48 ± 20.15). The most frequently occurring main line formulas were 11-9-7-, 9-7-5- and 7-7-5-. In general, type 11-9-7- (36%) predominated followed by 9-7-5- (6%) and 7-7-5- (4%). The frequency of 'rest' revealed a higher frequency of variation (54%) due to the inclusion of a number of infrequent model types.

INTRODUCTION

Dermatoglyphics is the study of dermal ridges on finger balls, palms and soles, with its qualitative and quantitative traits, which are not adaptive and free from paratypic influences (Reddy and Reddy 2006). The term dermatoglyphics (derma = skin and glyphē = carve) was first coined by Cummins and Midlo in 1926. Dermatoglyphics was often claimed to be associated with several diseases like congenital heart disease (Alter and Schulenberg 1970), schizophrenia (Bramon et al. 2005), cancer (Abbasi et al. 2006), diabetes (Kumbnani 2007) and other genetic disorders (Mukherjee 2006). Dermatoglyphics being an inexpensive and non-invasive measure remained unchanged throughout life and closely resembled among blood relatives and thus was widely used in studying personal identification, inheritance, anomalous patterns, medico-legal cases (Kumbnani 2007). Number of studies have been done in different parts of India to understand the ethnic and population differentiation of dermatoglyphic traits (Singh and Bhasin 1980;

Bhasin et al. 1994; Bhasin and Walter 2001; Reddy and Reddy 2006) and revealed regional, linguistic and population level variations in the distribution of dermatoglyphic traits. However, the utility of dermatoglyphics in local population studies derives from their strong genetic determination, lifelong stability, absence of environmental influence, and apparent lack of differential selective advantage (Hauser 1986); their analysis gives a different perspective on local population structure and relationships, and provides a dimension that is largely independent of those of serological polymorphisms, anthropometry, and other variables (Greally and Roberts 1991). However, it is also evident that there exists little information on finger and palmar dermatoglyphics among the Sunni Muslims, especially in eastern India. Hence, the present study was attempted to investigate the distribution of some finger and palmar dermatoglyphic traits among Sunni Muslim of Howrah district, West Bengal.

MATERIALS AND METHODS

The present cross-sectional study comprised of 225 adults Sunni Muslim males from three villages, namely, Hallyan, Raidighi and Najerpur of Howrah district, West Bengal, India. Standard ink methods for fingerprints and palm prints as described in Cummins and Midlo (1961) were used. The dermatoglyphic traits

Corresponding author:
Dr. Arup Ratan Bandyopadhyay
Department of Anthropology,
University of Calcutta,
35 Ballygunge Circular Road
Kolkata 700 019, West Bengal, India
E mail: abanthro@caluniv.ac.in

Table 1: Frequency distribution of finger ball pattern

Digits	Side	Whorl %	Loop		Arch	
			Radial %	Ulnar %	Simple %	Tented %
I	L	30.46	0.66	17.88	1.32	0
	R	29.13	0	20.52	0	0
	L+R	29.72	13.02	1.32		
II	L	23.12	2.04	19.04	5.44	1.36
	R	23.12	2.04	7.72	2.04	2.04
	L+R	46.24	7.71	2.72		
III	L	20.14	0	32.37	0	1.22
	R	14.34	0	31.65	0	0
	L+R	34.53	32.01	1.22		
IV	L	30.06	0	15.33	0	1.43
	R	37.42	0	15.95	0	0
	L+R	67.48	15.64	1.43		
V	L	20.00	1.22	28.66	0	0
	R	17.33	1.22	30.66	0.66	0
	L+R	34.35	15.44	0.66		

considered in the present study includes finger ball pattern types, ridge counts and main line formula. Descriptive statistics includes frequency distribution, mean and standard deviation.

RESULTS AND DISCUSSION

For the present cross-sectional study finger and palmar qualitative and quantitative characters such as finger ball pattern, ridge counts and main line formula have been studied. Frequency distribution of finger ball pattern was shown in Table 1. The results revealed that among adult Sunni Muslim males, the overall frequency of whorl was higher followed by loop and arch. However, comparison with the studies (Bhasin 2007) in caste and tribal population revealed comparatively lower prevalence of whorl, loop and arch in Sunni Muslim. The cardinal feature was that the order of prevalence of whorl, loop and arch in the overall Indian population was loop>whorl>arch (Bhasin 2007), but among the Sunni Muslims of the present study, it was whorl>loop>arch. Table 2 shows the mean and SD of ridge count in the form of total finger ridge count (TFRC) and absolute finger ridge count (AFRC). The results revealed that the mean TFRC was higher in right hand (99.16 ± 38.60) compared to left hand (67.64 ± 20.12). Comparison of mean TFRC of the present study with the studies (Bhasin 2007) among caste and tribal population revealed lower mean TFRC among Sunni Muslims. However, with regard to the AFRC, an inverse

Table 2: Distribution of TFRC and AFRC

Ridge count	Side	Total	Mean	SD
TFRC	L	5304	67.64	20.12
	R	5427	99.16	38.60
AFRC	L	7480	98.84	38.87
	R	7626	68.48	20.15

result has been observed, i.e. the mean AFRC was higher in left hand (98.84 ± 38.87) compared to right hand (68.48 ± 20.15). Frequency distribution of main line formula (Table 3) revealed that among the Sunni Muslims many different main line formula were observed. The most frequently occurring main line formula were 11-9-7-, 9-7-5- and 7-7-5-. However, less frequently occurring types were categorized under 'rest' (Table 3). In general, type 11-9-7- (36%) predominated followed by 9-7-5- (6%) and 7-7-5- (4%). The frequency of 'rest' revealed a higher frequency of variation (54%) due to the inclusion of a number of infrequent model types. The predominant main line type 11-9-7- in Sunni Muslim was also observed in caste (Bhasin et al. 1994) and tribal (Reddy and Reddy 2006) populations of India. However, the previous study (Reddy and Reddy 2006) among the tribal population revealed the pre-

Table 3: Frequency distribution of main line formulae

Main line formula	R	L	R+L
11-9-7-	36	36	36
9-7-5-	12	0	6
7-7-5-	0	8	4
Rest	52	56	54

dominant model type, 11-9-7- occurs more frequently on right palms, contrary to that, the present study in Sunni Muslim revealed that the predominant model type, 11-9-7- occurs in equal frequency in both hands. Moreover, type 9-7-5- was present only in right hand, on the other hand type 7-7-5- was present only in left hand.

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