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A STUDY OF DERMAL PATTERNS IN A FAST DWINDLING TRIBE

ABSTRACT. — In the present study an attempt has been made to find out the dermal pattern differences in terms of sexual dimorphism and bilateral asymmetry in the Great Andamanese of the Andaman Archipelago and also to establish their origins, if possible. Sexual dimorphism is exhibited for the value of Dankmeijer and Furuhata Indices. Similarly bilateral asymmetry is seen in the main line formulae of right and left hands of males. Finger and palm prints have been found to be of no utility to establish the origin of the present populations.

KEY WORDS: Dermal Patterns — Great Andamanese — Sexual Dimorphism — Bilateral Asymmetry.

INTRODUCTION

The utility of dermatoglyphics is well known in the modern times. Hence considerable stress has been laid on the epidermal ridge patterns on the palms and fingers for racial, genetical and criminological studies. The importace of these studies becomes more conspicuous particularly in isolated human populations. The application of these studies in racial classification and determination of ethnic affinities is quite frequent in the literature, but the results of such studies have not been very encouraging due to lack of knowledge of its genetical mechanism, multiplicity of phenotypic variations and the evolutionary factors involved and their trends.

In the Andaman and Nicobar Islands, for instance, ethnically diverse populations (so as to have diverse genetical strains or at least tend to become, due to long genetic isolation) like the Negritos and the settlers have shown homogeneity in their respective groups due to genetical, cultural and geographical isolation. One finds quite often also marked variations in sexual dimorphism and bilateral asymmetry in interpopulation differences. In the present context an attempt has been made to find out whether the differences are marked or not and also to establish their origin, if possible.

MATERIAL AND METHOD

There are four tribes in the Andaman archipelago, namely: the Andamanese, Onges, Jarawas and Sentinelese, all belonging to the Negrito stock. Till almost the end of the 18th century the total population in all these groups was estimated to be 5000 to 8000. After the British occupation, these groups came in direct conflict and contact with the civilisation and this phenomenon has brought the groups almost on the verge of extinction. Of all tribes the Andamanese were the worst sufferers. The males having lost their vitality and females their fertility due to tuberculosis and venereal diseases, they are now on the verge of complete extinction and striving for their survival.

TABLE 1-A *Frequency of finger print patterns (Males — 6)*

Pattern	Right												Left										Total (R + L)	
	I		II		III		IV		V		Total		I		II		III		IV		V		Total		n	%
	n	%	n	%	n	%	n	%	n	%	n (R)	%	n	%	n	%	n	%	n	%	n	%	n (L)	%		
Arch (plain)	—	—	—	—	1	16.67	—	—	—	—	1	3.33	—	—	2	33.33	1	16.67	—	—	—	—	3	10.0	4	6.67
Arch (Tented)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total arches	—	—	—	—	1	16.67	—	—	—	—	1	3.33	—	—	2	33.33	1	16.67	—	—	—	—	3	10.0	4	6.67
Loop (ulnar)	1	16.67	2	33.33	5	83.33	5	83.33	5	83.33	18	60.0	2	33.33	2	33.33	5	83.33	2	33.33	5	83.33	16	53.33	34	56.67
Loop (radial)	—	—	2	33.33	—	—	—	—	—	—	2	6.67	—	—	—	—	—	—	—	—	—	—	—	—	2	3.33
Total loops	1	16.67	4	66.67	5	83.33	5	83.33	5	83.33	20	66.67	2	33.33	2	33.33	5	83.33	2	33.33	5	83.33	16	53.33	36	60.00
Whorls (CC)	1	16.67	—	—	—	—	1	16.67	1	16.67	3	10.00	1	16.67	2	33.33	—	—	2	33.33	—	—	5	16.67	8	13.33
Whorls (SS)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whorls (DS)	3	50.0	—	—	—	—	—	—	—	—	3	10.00	—	—	—	—	—	—	1	16.67	—	—	1	3.33	4	6.67
Twin loop	—	—	1	16.67	—	—	—	—	—	—	1	3.33	2	33.33	—	—	—	—	—	—	1	16.67	3	10.0	4	6.67
Lateral pocket loop	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Central pocket loop	1	16.67	1	16.67	—	—	—	—	—	—	2	6.67	1	16.67			—	—	1	16.67	—	—	2	6.67	4	6.67
Total whorls	5	83.33	2	33.33	—	—	1	16.67	1	16.67	9	30.00	4	66.67	2	33.33	—	—	4	66.67	1	16.67	11	36.67	20	33.33
Grand Total no. of Fingers	6		6		6		6		6		30		6		6		6		6		6		30		60	

TABLE 1-B. *Frequency of finger print patterns (Females — 6)*

Pattern	Right												Left										Total (R + L)	
	I		II		III		IV		V		Total		I		II		III		IV		V		Total		n	%
	n	%	n	%	n	%	n	%	n	%	n(R)	%	n	%	n	%	n	%	n	%	n	%	n(L)	%		
Arch (plain)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	16.67	—	—	—	—	—	—	1	3.33	1	1.67
Arch (Tented)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total arches	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	16.67	—	—	—	—	—	—	1	3.33	1	1.67
Loop (ulnar)	2	33.33	3	50.0	3	50.0	1	16.67	5	83.33	14	46.67	2	33.33	2	33.33	4	66.67	2	33.33	4	66.67	14	66.67	28	46.67
Loop (radial)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total loops	2	33.33	3	50.0	3	50.0	1	16.67	5	83.33	14	46.67	2	33.33	2	33.33	4	66.67	2	33.33	4	66.67	14	66.67	28	46.67
Whorls (CC)	—	—	—	—	—	—	2	33.33	1	16.67	3	10.0	1	16.67	3	50.0	1	16.67	4	66.67	1	16.67	10	33.33	13	21.67
Whorls (SS)	1	16.67	1	16.67	—	—	—	—	—	—	2	6.67	1	16.67	—	—	—	—	—	—	—	—	1	3.33	3	5.0
Whorls (DS)	1	16.67	1	16.67	1	16.67	1	16.67	—	—	4	13.33	1	16.67	—	—	—	—	—	—	—	—	1	3.33	5	8.33
Twin loop	1	16.67	—	—	1	16.67	—	—	—	—	2	6.67	1	16.67	—	—	1	16.67	—	—	—	—	2	6.67	4	6.67
Lateral pocket loop	1	16.67	—	—	1	16.67	1	16.67	—	—	3	10.00	—	—	—	—	—	—	—	—	—	—	—	—	3	5.0
Central pocket loop	—	—	1	16.67	—	—	1	16.67	—	—	2	6.67	—	—	—	—	—	—	—	—	1	16.67	1	3.33	3	5.0
Total whorls	4	66.67	3	50.0	3	50.0	5	83.33	1	16.67	16	53.33	4	66.67	3	50.0	2	33.33	4	66.67	2	33.33	15	50.0	31	51.66
Grand Total No. of Fingers	6		6		6		6		6		30		6		6		6		6		6		30		60	

The Adamanese scattered all over the Andaman Islands, were first settled in 1949 at Bluff Island by the Forest Department and were subsequently shifted to the present site (Strait Island) in 1970, by the local administration. Strait Island is about 1.2 Sq. miles in area and is located about 35 miles north-east of Port Blair. It is surrounded by North Passage Island in the north, Baratong Island in the west, Qutram Island in the east and Wilson Island in the South and situated between latitudes 12° 13′ to 12° 14′ and longitudes 92° 50′ to 92° 52′ E.

In March '78 when a short visit to Strait Island was undertaken only 15 Andamanese could be contacted out of a total of 23 (15 males and 8 females) as other (mostly menfolk) were away to different places. Palmar prints of all the 15 (males, females) individuals were taken. In three cases one or more fingers were deformed. Two children have been excluded from the sample because of their very young age. The present sample apparently may look very small but considering the overal size of this population, it is a good representative sample. For identifying the prints Cummins and Midlo (1943) have been followed.

OBSERVATION

Tables 1A and *B* show the frequencies of finger ball patterns on both hands of 6 males and 6 females. In males one plain arch is seen in the right hand and three in the left hand (6.67 %) whereas in females only one plain arch is seen in the right hand thus comprising about 1.67 % of the total patterns. The frequencies of loops (ulnar and radial) are higher in males (60.0 %) than in females (46.67 %). This phenomenon is reversed for whorls (true and composite) i.e. males have only 33.33 % whorls and females 51.66 %. Of all the patterns, ulnar loop is the most frequent in both sexes. The frequency in males is 53.67 % and in females 46.67 %. In fact, radial loop is practically absent in the Andamanese female sample.

Value of Furuhata, Dankmeijer and Pattern Intensity Indices are given in *Table 2*, for both sexes and have been calculated from total frequencies. Dankmeijer index is significantly higher in males in comparison to females, and the situation in the case of Furuhata index is just reversed. Pattern intesity index is more or less the same in both sexes.

RIDGE COUNT

Table 3 shows the total ridge count digit-wise of the left and right hand fingers for both sexes. There are no marked differences between the left and right hand digits of both sexes. The apparently common phenomenon for both sexes is that the Ist digit of the right hand recorded more ridge counts than that of the left hand and this situation is reversed for the IIIrd digit, where the left hand has got more ridge counts than the right hand. Other noteworthy feature is that the total ridge-count in females is greater than in males, which is very rare.

PALMAR PRINTS

Number and percentage of patterns of various configurational areas of palms in Andamanese males and females are given in *Tables 4a* and *4b*. An overall preponderance of open type is observed in the IInd, IIIrd and IVth interdigital palmar areas of

TABLE 2. *Value of three principal indices*

Sample	Furuhata index	Dankmeijer index	Pattern intensity index
Males (N: 6)	55.55	20.00	12.67
Females (N: 6)	118.52	3.12	15.17
M + F (N: 12)	87.04	11.56	13.92

(Calculated from total frequencies)

TABLE 3. *Mean ridge count of fingers*

Digit	Males			Females		
	Right	Left	R + L	Right	Left	R + L
I	30.67	25.67	—	29.83	26.5	—
II	13.17	12.33	—	18.0	18.17	—
III	7.67	9.0	—	18.5	15.00	—
IV	13.33	21.17	—	21.67	26.33	—
V	13.83	13.00	—	10.17	11.83	—
Total Av. Per hand	78.67	81.17	159.84	98.17	97.83	196.00

TABLE 4-A. *Pattern frequency on IInd, IIIrd and IVth interdigital areas (Males)*

Pattern	IInd interdigital						IIIrd interdigital						IVth interdigital					
	R		L		R + L		R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
O	6	75.0	6	75.0	12	75.0	6	75.0	6	75.0	12	75.0	2	25.0	—	—	2	12.5
M	2	25.0	2	25.0	4	25.0	—	—	1	12.5	1	6.25	—	—	—	—	—	—
Lu	—	—	—	—	—	—	1	12.5	—	—	1	6.25	5	62.5	5	62.5	10	62.5
lu	—	—	—	—	—	—	1	12.5	—	—	1	6.25	—	—	—	—	—	—
o/lu	—	—	—	—	—	—	—	—	1	12.5	1	6.25	—	—	2	25.0	2	12.5
V	—	—	—	—	—	—	—	—	—	—	—	—	1	12.5	—	—	1	6.25
lu/o	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	12.5	1	6.25
								—										

TABLE 4-B. *Pattern frequency on IInd, IIIrd and IVth interdigital (Females)*

Pattern	IInd interdigital						IIIrd interdigital						IVth interdigital					
	R		L		R + L		R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
O	3	42.86	3	42.86	6	42.86	7	100	5	71.41	12	85.71	—	—	—	—	—	—
M	4	57.14	4	57.14	8	57.14	—	—	1	14.29	1	7.14	—	—	1	14.29	1	7.14
Lu	—	—	—	—	—	—	—	—	—	—	—	—	6	85.71	6	85.71	12	85.71
lu	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
o/lu	—	—	—	—	—	—	—	—	1	14.29	1	7.14	—	—	—	—	—	—
V	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
lu/o	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
O/V	—	—	—	—	—	—	—	—	—	—	—	—	1	14.29	—	—	1	7.14

TABLE 5. *Pattern frequency on hypothenar area*

Pattern	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
A^u	8	100	7	87.5	15	93.75	3	42.86	4	57.14	7	50.00
$A^{u/Ac}$	—	—	1	12.5	1	6.25	2	28.57	3	42.86	5	35.72
A^c	—	—	—	—	—	—	1	14.29	—	—	1	7.14
L^r	—	—	—	—	—	—	1	14.29	—	—	1	7.14

both sexes except for higher frequency of the ulnar loop in the IVth interdigital areas in both sexes.

Hypothenar areas show a considerably high frequency of arch pattern in males, whereas in females it is relatively less frequent *(Table 5)*. Similarly for thenar / Ist interdigital area, open type pattern is very common *(Table 6)*.

MAIN PALMAR LINES

The frequency of the three principal main line formulae for males and females has been recorded in *Table 7* for both hands. The right hand in males is with higher frequency of 11.9.7. and 9.7.5., and the left one with 7.5.5. — whereas in females there

TABLE 6. *Pattern frequency on thenar / Ist interdigital area*

Pattern	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
O	7	87.5	7	87.5	14	87.5	5	71.43	5	71.43	10	71.43
V/O	1	12.5	1	12.5	2	12.5	2	28.57	2	28.51	4	28.57

TABLE 7-A. *Frequency of three principal main line formula*

Group	Side	11.9.7		9.7.5.		7.5.5		Rest	
		n	%	n	%	n	%	n	%
Males (N : 8)	Right	3	37.5	3	37.5	1	12.5	1	12.5
	Left	—	—	1	12.5	4	50.00	3	37.5
	R + L	3	18.75	4	25.0	5	31.25	4	25.00
Females (N : 7)	Right	1	14.29	2	28.57	1	14.29	3	42.87
	Left	1	14.29	1	14.29	4	57.14	1	14.29
	R + L	2	14.29	3	21.43	5	35.71	4	28.57
Males + Females	R + L	5	16.67	7	23.33	10	33.33	8	26.67

TABLE 7-B. *Variations of 'C' line terminations*

Type	Males						Females					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
Ulnar	6	75.0	5	62.5	11	68.75	6	85.71	6	85.71	12	85.71
Radial	2	25.0	3	37.5	5	31.25	1	14.29	1	14.29	2	14.29
Proximal	—	—	—	—	—	—	—	—	—	—	—	—
Absent	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 8. *Frequency of terminations of palmar main lines*

Line ending	Males						Females					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
7	5	62.5	1	12.5	6	37. 5	4	57.14	1	14.29	5	35.72
8	1	12.5	1	12.5	2	12.5	1	14.29	3	42.86	4	28.57
9	2	25.0	3	37.5	5	31.25	1	14.29	2	28.57	3	21.57
10	—	—	—	—	—	—	—	—	—	—	—	—
11	—	—	3	37.5	3	18.75	1	14.29	1	14.29	2	14.29
12	—	—	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—
Total	8		8				7		7			

TABLE 9. *'C' Line*

Line ending	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
5″	4	50.0	1	12.5	5	31.25	4	57.14	1	14.29	5	35.72
6	1	12.5	1	12.5	2	12.50	1	14.29	3	42.86	4	28.57
7	1	12.5	3	37.5	4	25.00	1	14.29	2	28.57	3	21.57
8	—	—	—	—	—	—	—	—	—	—	—	—
9	2	25.00	3	37.5	5	31.25	1	14.29	1	14.29	2	14.29
10	—	—	—	—	—	—	—	—	—	—	—	—
11	—	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—

TABLE 10. *'B' Line*

Line ending	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
5′	2	25.00	3	37.5	5	31.25	3	42.86	—	—	3	21.57
5″	6	75.00	2	25.0	8	50.00	3	42.86	6	85.71	9	64.29
6	—	—	3	37.5	3	18.75	—	—	—	—	—	—
7	—	—	—	—	—	—	1	14.29	1	14.29	2	14.29

TABLE 11. *Line 'A'*

Line ending	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
3	7	87.5	4	50.0	11	68.75	7	100	3	42.86	10	71.43
4	—	—	2	25.00	2	12.50	—	—	2	28.57	2	14.29
5′	1	12.5	2	25.00	3	18.75	—	—	2	28.57	2	14.29

TABLE 12. *Frequency distribution of main line index*

MLI	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
5	1	12.5	5	62.5	6	37.5	1	14.29	4	57.16	5	35.72
6	1	12.5	1	12.5	2	12.5	1	14.29	1	14.29	2	14.29
7	2	25.0	1	12.5	3	18.75	2	28.57	1	14.29	3	21.43
9	1	12.5	1	12.5	1	6.25	1	14.29	1	14.29	2	14.29
10	2	25.0	—	—	2	12.5	1	14.29	—	—	1	7.15
11	1	12.5	—	—	1	6.25	—	—	—	—	—	—
8	—	—	—	—	—	—	1	14.29	—	—	1	7.15

TABLE 13. *Frequency of axial triradius position*

Position of t	Males (8)						Females (7)					
	R		L		R + L		R		L		R + L	
	n	%	n	%	n	%	n	%	n	%	n	%
t	8	100	8	100	16	100	4	57.14	6	85.71	10	71.43
t′	—	—	—	—	—	—	2	28.57	1	14.29	3	21.43
t″	—	—	—	—	—	—	1	14.29	—	—	1	7.14

is no special tendency for right hand but 7.5.5., is again more preponderant for left hand.

Terminations of Main Line DCBA are presented in *Tables 8, 9, 10* and *11,* along with details of the endings of various lines in various areas for either sex.

The value of frequency distribution of the main line indices is recorded in *Table 12.* Males and females show close similarities in the main line index value of 5, 6 and 9.

AXIAL TRIRADII

Males show 100 % frequency of triradii t for both hands. Females also tend to follow this trend, but still 21.43 % are having triradii t′ and 7.14 % triradii t′′ *(Table 13).*

DISCUSSION

An overall comparison of the Andamanese with other Negrito populations shows some remarkable diversities and similarities. The frequency of various papillary patterns in some Negrito groups are given in *Table 14,* and have been compared with the present study. A notable feature of Table 14 is that the present results are different from the earlier study of Sarkar (1954) in the Great Andamanese. The possible reasons attributed to this situation:

Firstly the sample considered for the study is very small and secondly the subjects which were included in the study in 1954 might have been ommitted in this study unintentionally i.e. some of them were not available, some are dead and some were born after the previous study. Another possible reason could be that Great Andamanese have been in contact with outsiders for the last 120 years.

TABLE 14. *Percentage of papillary patterns in different Negrito populations*

Population	Sex	N	Whorls	Loops	Arches	Author
Andaman Islands						
Onge	M	24	35.71	62.18	2.10	Gupta & Basu, 1960
Onge	F	19	31.55	67.91	0.53	Gupta & Basu, 1960
Andamanese	M + F	15	23.33	76.00	0.67	Sarkar, 1954
Andamanese	M	6	33.33	60.00	6.67	Malhotra & Rao Present study
Andamanese	F	6	51.66	46.67	1.67	Malhotra & Rao Present study
Andamanese	M + F	12	42.50	53.33	4.17	Malhotra & Rao Present study
Oceanic Islands						
Aeta from Zambales	M + F	101	47.2	52.5	0.3	Weninger, 1952
Aeta from Bataan	M + F	51	59.3	39.2	1.6	Weninger, 1952
Aeta from Camarines	M + F	38	69.9	27.9	2.3	Weninger, 1952
Semang	M + F	56	60.3	39.7	—	Weninger, 1952
Ayom Pygmies	M	218	59.2	40.3	0.4	Geipel, 1958
Ayom Pygmies	F	71	53.8	45.5	0.4	Geipel, 1958
Africa						
Bushmen (Kun)	M	164	15.1	71.9	13.0	Cummins, 1955
Bushmen (Kun)	F	184	17.1	63.6	19.4	Cummins, 1955
Bushmen (Barkwengo)	M	44	30.7	64.1	5.2	Cummins, 1955
Bushmen (Barkwengo)	F	61	25.9	64.6	9.6	Cummins, 1955
Bushmen (Kanikwe)	M	23	38.7	54.3	7.0	Cummins, 1955
Bushmen (Kanikwe)	F	34	32.1	61.7	6.2	Cummins, 1955
Bushmen (Haikom)	M	17	30.6	67.0	2.4	Cummins, 1955
Bushmen (Haikom)	F	20	24.5	65.0	10.5	Cummins, 1955
Northern (Auen) Bushmen	M + F	53	16.4	59.2	24.3	Tobias, 1961
Central Bushmen	M + F	180	25.7	61.6	12.7	Tobias, 1961
Southern (Magon) Bushmen	M + F	81	34.6	49.4	16.0	Tobias, 1961
Bushmen (Haikum) Auni)	M + F	32	15.1	68.5	16.4	Weninger, 1936
Hottentot	M + F	50	18.6	76.3	5.1	Fleischhacker, 1934
Pygmies (Bastards)	F	24	17.5	70.1	12.4	Valsik, 1938
Efe Pygmies	M	153	19.6	64.4	15.9	Dankmeijer, 1947
Efe Pygmies	F	54	19.6	62.7	17.6	Dankmeijer, 1947
Bakola Pygmies	M	130	36.4	57.6	6.1	Dankmeijer, 1938
Bakola Pygmies	F	103	34.0	57.7	8.3	Dankmeijer, 1938
Bayaka Pygmies	M	203	41.5	52.6	5.9	Dankmeijer, 1938
Bayaka Pygmies	F	100	44.1	52.0	3.9	Dankmeijer, 1938
Aka Pygmies	M + F	—	17.4	70.6	12.0	Dankmeijer, 1938
Basua Pygmy	M + F	—	18.8	71.2	10.0	Geipel, 1950
Twa-Pygmy	M + F	360	27.3	64.7	8.0	Geipel, 1950
Congo Pygmy	M + F	886	16.2	69.2	14.6	Abel, 1940

sent joint group (M+F) show affinity in terms of P.T.I., is again the Aeta from Zambales in Oceanic Islands. The males and females, individually in the present study show closeness to the Bushmen (Barkwengo) and the Ayom Pygmies respectivelly.

Similarly the comparative values of the three principal mainline formulae have been recorded in *Table 16.* From the percentage values for various populations it is really difficult to deduce any formula, which may be typical of Negritos. However, a remarkable closeness in the frequency of mainline formula 9.7.5., is found between the Andamanese and the Aeta (Zambales), the Onges, the Bushmen and the Semang.

CONCLUSION

By now it is more or less established that the Andamanese have their ethnic affinity with the South-East Asiatic Negritos, but the finger and palm prints do not throw any light to this relationship. The papillary patterns show that the Andamanese (joint sample) are quite close to the Bayaka Pygmies and also to the Aeta of Zambales in Oceanic Islands in terms of frequency of whorls and loops. Apparently the Andamanese show no closeness to the Onges in terms of papillary patterns, but the pattern intensity index brings them quite close. If the main line formula is to be taken as an indicator for ethnic affinities, no definite trend can be predicted. The overall outcome of the present study can be summed up as "due to wide variation in the various finger ball and palmar patterns it is rather difficult to pinpoint the origin of Negritos and to trace their migration lines". All this may be explained firstly in terms of non-availability of the mode of inheritance of dermal patterns and secondly by migration and segregation of Negrito stock in different directions with a lot of inbreeding. In the present group, particularly, the problem of ascertaining their origin is further intricated due to a lot of cross-breeding with different groups, since 1858, when the first penal settlement was established by the British Government on these islands.

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