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## VARIATION IN PALMAR C LINE TERMINATION POLYMORPHISM AMONG SOME ENDOGAMOUS GROUPS OF ASSAM

**ABSTRACT.** — *The present paper deals with the occurrence of the palmar C line termination in ten endogamous groups of Assam. The study sample includes 526 unrelated males from Assamese Brahmin, Kalita, Jogi, Kaibarta, Lalung, Mishng, Chutiya, Moran, Deuri and Muslim. The bimanual and population variation concerning the distribution of four types of main line C have been examined in the present report. It is found that the Mongoloid populations differ significantly from each of the high caste, low caste and Muslims, among whom no significant differences are observed. The results of the present study are compared with the available materials from Assam in order to assess the group differences or similarities.*

**KEY WORDS:** *Dermatoglyphs — Assam — Polymorphism — Variability.*

### INTRODUCTION

The triradius at the base of the digit IV is triradius *c* and its proximal radiant in main line *C*. Line *C* is the only main line of the palm which is truly polymorphic (Plato 1970) since it demonstrates qualitative variation manifested in the degree of transversality suggested by ulnar, radial or proximal direction of line, as well as quantitative variation suggested by size reduction (*X*, *x*). Line *C* even may be completely absent when no triradius *c* is present.

Rife (1969) was the pioneer in pointing out the importance of *C* line termination in understanding population discrimination. He was followed by Plato (1970) who classified *C* line termination into four model types, viz. Radial (9, 10, 11, 12, 13), Ulnar (4, 5, 6, 7), Proximal (*X*, *x*) and Absent ( $\emptyset$ ). Later on Bhattacharya (1971) grouped *C* line termination in three classes, viz. *Type I* (all Ulnar terminations), *Type II* (all Radial terminations) and *Type III* (Abortive and Absent).

The objective of the present investigation is to evaluate the bilateral and population differences exhibited by palmar *C* line termination in ten endogamous groups of Assam, India. The study sample includes individuals from Hindu castes (Brahmin, Kalita, Jogi, Kaibarta), Mongoloid populations (Lalung, Mishng, Chutiya, Moran, Deuri) as well as Muslims of Assam. Attempt is made to bring out the similarities and differences among the populations under consideration in respect of palmar *C* line termination. Further, the present data have been compared with the available materials of Assam.

### MATERIAL AND METHOD

Palmar prints were collected with common printer's black ink from 526 males following the technique recommended by Cummins and Midlo (1961). The nature of the sample excludes the possi-



TABLE 1. *Distribution of Modal types of palmar main line C*

Population	Hand	No	Ulnar %	Radial %	Proximal %	Absent %
Brahmin	Right	53	41.51	47.16	3.77	7.55
	Left	53	47.16	35.85	3.77	13.21
	<i>R + L</i>	106	44.34	41.51	3.77	10.38
Kalita	Right	58	32.76	58.62	8.62	—
	Left	58	70.68	18.97	10.34	—
	<i>R + L</i>	116	51.72	38.79	9.48	—
High caste	Right	111	36.94	53.15	6.31	3.60
	Left	111	59.46	27.02	7.20	6.31
	<i>R + L</i>	222	48.20	40.09	6.76	4.95
Jogi	Right	41	39.02	51.22	7.32	2.44
	Left	41	60.97	31.71	—	7.32
	<i>R + L</i>	82	50.00	41.46	3.66	4.88
Kaibarta	Right	49	46.94	42.85	6.12	4.08
	Left	49	46.94	32.65	10.20	10.20
	<i>R + L</i>	98	46.94	37.76	8.16	7.14
Lower Caste	Right	90	43.33	46.66	6.66	3.33
	Left	90	53.33	32.22	5.55	8.88
	<i>R + L</i>	180	48.33	39.44	6.11	6.11
Caste (Hindu)	Right	201	39.80	50.25	6.47	3.48
	Left	201	56.71	29.35	6.47	7.46
	<i>R + L</i>	402	48.26	39.80	6.47	5.47
Muslim	Right	58	39.66	48.28	6.89	5.17
	Left	58	51.72	29.31	6.89	12.07
	<i>R + L</i>	116	45.69	38.79	6.89	8.62
Lalung	Right	45	55.55	31.11	6.66	6.66
	Left	45	60.00	24.44	2.22	13.33
	<i>R + L</i>	90	57.77	27.77	4.44	10.00
Mishing	Right	60	55.00	28.33	8.33	8.33
	Left	60	66.66	10.00	11.66	11.66
	<i>R + L</i>	120	60.83	19.16	10.00	10.00
Moran	Right	52	63.46	32.69	1.92	1.92
	Left	52	75.00	13.46	7.69	3.84
	<i>R + L</i>	104	69.23	23.07	4.80	2.88
Chutia	Right	56	37.50	48.21	7.14	7.14
	Left	56	57.14	12.50	7.14	23.21
	<i>R + L</i>	112	47.32	30.35	7.14	15.18
Deuri	Right	54	48.14	37.03	12.96	1.85
	Left	54	62.96	27.77	7.40	1.85
	<i>R + L</i>	108	55.55	32.40	10.18	1.85
Mongoloid (pooled)	Right	267	51.68	31.58	7.49	5.24
	Left	267	64.41	17.22	7.49	10.86
	<i>R + L</i>	534	58.05	26.40	7.49	8.05



TABLE 2. Results of Chi-square tests

Population	Chi-square value
<i>Bimanual Variation</i>	
Brahmin	1.827
Kalita	19.912++
High Caste	16.175++
Jogi	7.857*
Kaibarta	2.461
Lower caste	5.674
Hindu caste	19.892++
Assamese Muslim	5.213
Lalung	2.436
Mishing	6.598
Moran	6.799
Chutia	18.812++
Deuri	2.598
Mongoloid population	25.989++
<i>Population Variation</i>	
Brahmin × Kalita	15.434+
Brahmin × Jogi	2.071
Brahmin × Kaibarta	2.529
Brahmin × Assamese Muslim	1.304
Kalita × Jogi	8.092*
Kalita × Kaibarta	8.657*
Kalita × Assamese Muslim	10.907**
Jogi × Kaibarta	2.100
Jogi × Assamese Muslim	2.133
Kaibarta × Assamese Muslim	0.292
Lalung × Mishing	3.333
Lalung × Moran	5.378
Lalung × Chutiya	2.815
Lalung × Deuri	8.393*
Mishing × Moran	7.208
Mishing × Chutiya	6.692
Mishing × Deuri	10.341**
Moran × Chutiya	14.833+
Moran × Deuri	5.520
Chutiya × Deuri	12.701+
High caste × Low caste	0.317
High caste × Assamese Muslim	1.784
High caste × Tribe	14.638+
Low caste × Assamese Muslim	0.805
Low caste × Tribe	11.026**
Hindu caste × Assamese Muslim	1.617
Hindu caste × Tribe	19.423++
Assamese Muslim × Tribe	7.815*

\* Significant at 0.05 level of *p*.\*\* Significant at 0.02 level of *p*.+ Significant at 0.01 level of *p*.++ Significant at 0.001 level of *p*.

bility of specific characteristics coming from related persons. The classification of the *C* line terminations established by Plato (1970) was followed. The difference between and among the groups have been determined with the chi-square test.

## RESULTS AND DISCUSSION

Table 1 summarize Plato's four model types of *C* line terminations among the population under consideration. It has been noticed that all our groups

characteristically show a prevalence of the ulnar type. Among the Brahmin both ulnar and radial types occur almost in equal frequencies. In most of the cases radial type is observed to associate more with the right palm, whereas ulnar, proximal and absent types do so with the left palm. This finding is in conformity with that of Plato (1970). The present study exhibits significant bimanual variations only in Kalita, Jogi and Chutiya. The Chi-square value in others are not significant suggesting bilateral symmetry among them. Therefore, perhaps no far reaching conclusions should be drawn from it.

Complete absence of "Absent category" in Kalita may be noted. As a result, only Kalita differ significantly from all other Indid groups, among whom no such differences are observed and thus they (Kalita) form a completely distinct group in this regard. When a comparison is made among the high caste, low caste and Muslims, it is found that they are similar to one another. The total Hindu (castes) are also indistinguishable from the Muslims. Among the Mongoloid population only Deuri remain apart from others except Moran by their conspicuously lowering of "Absent category". However, the chi-square value for Moran × Chutiya is also significant (Table 2). Again, when the data of all the five Mongoloid populations are considered together, it is seen that one pooled Mongoloid population differs from each of the sections of Hindu i.e. high caste, low caste and total Hindu as well as from Muslims.

It is at once clear from Table 3. that the *C* lines in the populations under consideration have a tendency to segregate on the ulnar side. This is in conformation with the study of Bhanu et al. (1975) who observed that the population groups from the Eastern India have a tendency to segregate on the ulnar side. The ulnar type of *C* line is much more frequent in Mongoloid population than the Indids (castes and Muslims). The table also suggests that ulnar type shows widest range of variation (44.34 % to 82.26 %). At the next stage stand radial type (35.03 % to 11.53 %) followed by combined data of proximal and absent (22.32 % to 2.91 %) types.

The study reveals the following facts. One, that the pooled Mongoloid population differs significantly from the Indid groups of Assam in respect of the trait. Two, that the Deuris are statistically distinct from the Chutiyas of Upper Assam though the Deuris and the Chutiyas are two sections of the same population. Three, that the peoples of Assam are overwhelmingly characterised by the ulnar type of palmar *C* line terminations.

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TABLE 3. C line termination in certain populations of Assam

Populations	Sex	No	Ulnar %	Radial %	Proximal & absent %	Source
Brahmin	M	53	44.34	41.51	14.15	Present study
Kalita	M	58	51.72	38.79	9.48	do
Jogi	M	41	50.00	41.46	8.54	do
Kaibarta	M	49	46.94	37.76	15.30	do
Muslim	M	58	45.69	38.79	15.51	do
Lalung	M	45	57.77	27.77	14.44	do
Mishing	M	60	60.83	19.16	20.00	do
Moran	M	52	69.23	23.07	7.68	do
Chutiya	M	56	47.32	30.35	22.32	do
Deuri	M	54	55.55	32.40	12.03	do
Hajong	M	65	76.16	11.53	12.30	Das 1966
Khamiyang	M & F	120	79.99	17.08	2.91	Barua 1976
Pati Rabha	M & F	205*	75.61	16.59	7.80	Das 1960
Rangdani Rabha	M & F	162*	75.31	14.81	9.88	Das 1960
Maitori Rabha	M & F	124*	82.26	12.10	5.65	Das 1960
Rajbansi	M	90	54.99	32.21	12.77	Das 1965-66
Kalita	M & F	317*	48.55	35.02	16.40	Das & Das 1965
Khamiyang	M & F	110	68.33	11.66	20.00	Das & Bhagabati 1964

\* indicates the number of palms studied

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