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Dermatoglyphics of Konda Reddys

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DIGITAL DERMATOGLYPHICS OF KONDA REDDIS

INTRODUCTION:

Finger ball prints of Man are classified in the three fold Henry - Galton's scheme of Arch-loop-whorl. But no single observation has been so far achieved regarding the exact assessment of the strength of the basic genetical factors responsible for these finger ball patterns. It has also been realised that the genetical factor responsible for whorl type of finger ball configuration is stronger than either of those responsible for loop type or arch type of finger ball configurations and the genetical factors responsible for the loop type of finger ball configuration is stronger than that for the arch type of finger ball configuration (Gruneberg-1928).

The genetics of dermatoglyphics is hampered by the multifactorial hereditary mechanism thus causing variability within and among different patterns. The dermatoglyphic features are free from any parakinetiic influences and are not subject to age and sex influences. The differentiation of dermatoglyphics occurs during the first month of intra-uterine life and the characteristics of the ridge patterns remain constant throughout the life span of an individual. Moreover, these features being free from assortative mating and not effected by genetic drift could be usually employed for the study of pupulation genetics.

The most expressed pattern is whorl and most reduced is arch. Speaking in terms of genetics whorl is controlled by large number of factors or genes than arch; since varieties are for more among in the former

than the later type of pattern. Thus the most intricate type of pattern whorl has been simplified into an arch which perhaps is controlled by the least number of genes.

The relation between the finger and toe patterns show some characteristic peculiarities with regard to the distribution of the total frequency of loops, whorls and arches. Arches are more frequent on toes, whereas the whorls are more common on fingers.

DIGITAL DERMATOGLYPHICS OF KONDA REDDIS:

The present study of digital Dermatoglyphics is meant for finding out the physical types of Konda Reddy tribe. Konda Reddy is the primitive tribal community living in the hilly tracts of Khammam, West and East Godavari districts on the banks of the river Godavari. Most of them are illiterates and their social life reveal their traditional primitive pattern of living. Agriculture is the Chief source of livelihood and they practice settled as well as Podu cultivation. There are other subsidiary occupations which are of less importance.

The Konda Reddis are characterized by sturdy stature, with legs that are short compared with the length of the body. They are broad palmed and broad soled with short fingers and toes. Their skin colour varies from a very light copper brown to dark Chocolate (Haimendorf).

Materials and Methodology:

The finger and palm impressions of 67 male and 55 female Konda Reddys of Maredumilli and Rajavommangi blocks of East Godavari District were collected. The data belongs to the unrelated persons. The analysis of the data was done in strict compliance with the techniques of Cummins and Midlo. Necessary cleaning is done before taking the finger prints.

Results:

The percentile frequencies of the finger prints of the two sexes are given separately in Table No. 1 and 2.

Table No.1 and 2

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- 4 -
TABLE NO. 1

PERCENTAGE FREQUENCY OF FINGER BALL PATTERNS IN 67 MALE INDIVIDUALS OF KONDA REDDYS OF EAST GODAVARI DISTRICT

Digits Hands	Whorls		Loops		Radial		Arches	
	(1) Abs. No.	(2) %	(3) Abs. No.	(4) %	(5) Abs. No.	(6) %	(7) Abs. No.	(8) %
I Rt	45	67.16	20	29.85	1	1.50	1	1.50
Lt	43	64.18	11	16.42	6	8.95	7	10.45
Rt + Lt	88	65.67	31	23.13	7	5.22	8	5.97
II Rt	36	53.73	24	35.82	2	2.99	5	7.46
Lt	29	43.38	21	31.34	8	11.94	9	13.42
Rt + Lt	65	48.51	45	33.58	10	7.46	14	10.45
III Rt	28	41.79	33	49.25	4	5.97	2	2.99
Lt	28	41.79	30	44.78	8	11.94	1	1.49
Rt + Lt	56	41.79	63	47.01	12	8.96	3	2.24
IV Rt	43	64.18	20	29.85	2	2.99	2	2.99
Lt	42	62.69	15	22.39	7	10.45	3	4.48
Rt + Lt	85	63.43	35	26.12	9	6.72	5	3.73
V Rt	32	47.76	32	47.76	2	2.99	1	1.49
Lt	30	44.78	23	41.79	7	10.45	2	2.99
Rt + Lt	62	46.27	60	44.78	9	6.72	3	2.24
All digits								
Rt	184	54.93	129	38.51	11	3.28	11	3.28
Lt	172	51.34	105	31.34	36	10.75	22	6.57
Rt + Lt	356	53.13	234	34.93	47	7.01	33	4.93

TABLE NO. 2
Percentage frequency of finger ball patterns in 55 females individuals of Konda Reddys (550 fingers)

Digits Hands	Whorls		Loops		Radial		Arches	
	Abs.No.	%	Abs.No.	%	Abs.No.	%	Abs.No.	%
I	Rt	31	20	36.36	1	1.82	3	5.45
	Lt	34	12	21.82	4	7.27	5	9.09
Rt + Lt	65	59.09	32	29.09	5	4.54	8	7.27
II	Rt	27	23	41.82	3	5.45	2	3.64
	Lt	27	15	27.27	7	12.73	6	10.91
Rt + Lt	54	49.09	38	34.55	10	9.09	8	7.27
III	Rt	14	35	63.64	3	5.45	3	5.45
	Lt	16	32	58.18	6	10.91	4	7.27
Rt + Lt	30	27.27	67	60.91	9	8.18	7	6.36
IV	Rt	32	20	36.36	2	3.64	1	1.82
	Lt	31	18	32.73	4	7.27	2	3.64
Rt + Lt	63	33	34.55	6	5.45	3	2.73	
V	Rt	22	29	52.73	2	3.64	2	3.64
	Lt	24	20	36.36	7	12.73	4	7.27
Rt + Lt	46	49	44.55	9	3.18	6	5.45	
All digits	Rt	126	127	46.18	11	4.00	11	4.00
	Lt	132	97	35.27	28	10.18	18	6.54
Rt + Lt	258	224	40.73	39	7.09	29	5.27	

It is observed from the table that the males possess high frequency of whorls (53.13%) than females (46.91%). The frequency of ulnar loops (34.93%), radial loops (7.01%) and arches (4.93%) among males is less than the frequency of ulnar loops (40.73%), radial loops (7.09%) and arches (5.27%) among females. Whorls and Ulnar loops occur in all the digits of the two hands in both the sexes. The highest frequency of whorls are observed in digit I in both the sexes, (65.67% in males and 59.09% in females) which is a universal phenomenon. In digit I, high frequency of whorls are observed in right hand in males and left hand in females. The table reveals that the next highest frequency of whorls are observed in IVth digit (i.e.) 63.43% in males and 57.27% in females. The highest frequency of ulnar loops are found in digit III in both males (47.01%) and females (60.91%) and the lowest frequency of ulnar loops are observed in digit I in both the sexes, i.e., 23.13% for males and 29.09% for females. The second highest percentage of ulnar loops are observed in the digit V (males 44.78%) and females 44.55%). The radial loops are found on all the digits of left and right hands of both the sexes, and their highest frequency is observed in the digit III of males (8.96%) and digit II of females (9.09%). And here one peculiarity observed is, the percentage of radial loops is high on the left hand of all the digits in both the sexes. The second highest percentage of radial loops are observed in digit II of males (7.46%) and digits III and V of females (8.18%). The arches are observed on all the digits of males and females. The highest frequency of arches are observed in the digit II of

males (10.45%) and digits I and II of females (7.27%). In arches also it is observed that the frequency is more in left hand in all digits except in digit III in both the sexes. This shows the uniformity of the presence of arches in males and females.

It is observed from the table that the frequency of whorls (53.13%) are more than the loops (ulnar + Radial) (41.94%) among males while among the females the frequency of whorls is less (46.91%) than Loops (47.82%) indicating sexual variation. As far as the occurrence of whorls and loops digit wise is concerned, the frequency of whorls is higher than the loops in digits I, II and IV in both the sexes.

In general it is found that the males possess more whorls and more ulnar loops on the right hand than the left hand and almost the reverse phenomenon is observed for radial loops and arches. In females the occurrence of more whorls is observed on the left hand in three digits (i.e.) except in digits II and IV. Like males, in females also more ulnar loops are observed on the right hand in all the digits and more radial loops and arches are found on the left hand in all the digits. This strikes the uniformity of the occurrence of finger ball patterns in both the sexes.

Table No. 3

Contd...8

Table. 3

Comparative Occurrence of whorls and Loops (R+U) in different digits of Konda Reddys

digits	Males (67)				Females (55)			
	Right	left	Rt+Lt	w/L Ratio	Right	left	Rt+Lt	w/L Ratio
I	W > L	W > L	W > L	1:0.431	W > L	W > L	W > L	1:0.569
II	W > L	W = L	W > L	1:0.646	W > L	W > L	W > L	1:0.668
III	W < L	W < L	W < L	1:1.399	W < L	W < L	W < L	1:2.533
IV	W > L	W > L	W > L	1:0.657	W > L	W > L	W > L	1:0.698
V	W < L	W < L	W < L	1:1.112	W < L	W < L	W < L	1:1.260

The general order of the comparative occurrence of whorls and loops in different digits are shown in Table 3. It is seen from the table that the order of the comparative occurrence of whorls and loops varies to some extent in the individual digits. In males, the prevailing order is $W > L$ in both the right and left hands on digits I and IV. The order $W < L$ is existing in both the right and left hands on digits III and V. Digit II of the left hand shows equal occurrence of whorls and loops and the same digit of right hand shows $W > L$ in males. It is observed from the table that the occurrence of whorls and loops is almost same in females when compared to males except in the left hand of digit II. The prevailing order is $W > L$ in both the right and left hands on digits I, II and IV in the females. The order $W < L$ is maintained in both the right and left hands on digits III and V in females which is similar to males.

The order of $W > L$ occurrence is observed on digits I, II and IV in both the sexes when right and left hands combined, where as in other digits the $W < L$ occurrence is maintained. In the males the combined whorl:loop ratio varies from 1:0.431 to 1:1.339 with a mean of 1:0.903. The minimum ratio is observed on digit I (1:0.431) and the maximum is found on the digit III (1:1.339) in males. Where as in females the combined whorl: loop ratio varies between 1:0.569 to 1:2.533. Similarly, in females also the minimum ratio is observed on digit I (1:0.569) and the maximum is found on digit III (1:2.533) with a mean of 1:1.964.

Pattern intensity index:

The different patterns with Pattern indices derived out of them for both the sexes are presented in

Table No: 4.

TABLE NO:4

PERCENTAGE OF PAPILLARY PATTERNS AND THEIR INDICES:

Tribe/Sex	Hands	Whorls	Loops		Arches	INDICES:		
			Ulnar	Radial		P.L.I	D.I	F.I
<u>Konda Reddys</u>								
Male	Rt + Lt	53.13	34.93	7.01	4.93	14.820	9.27	126.68
Females	Rt + Lt	46.91	40.13	7.09	5.27	14.104	11.23	99.34

* Pattern Intensity Index = (Whorls x 2) + Loops/10

** Dankmeijer's index = Arches/Whorls x 100

*** Furuhatata's index = Whorls/Loops x 100

Contd...12

Arches, loops and whorls form a sequence of increasing pattern complexity. This sequence has its parallel and increase in the number of triradii - the plain arch having none, the loop one and the whorl two. The number of triradii - accordingly is available for a simple quantitative statement of pattern intensity.

The pattern intensity index of males (14.820) and females (14.104) of Konda Reddys are close and the difference is not significant, though the males possess slightly higher index. The Dankmeijer's index (Arch/whorl index) in males (9.27) is lesser than their female counterparts (11.23) as the females possess comparatively more arches than males. This is in conformity with the observation of Cummins and Midle (1961, 272) that females almost universally differ from males in having more arches, and usually they differ also in bearing fewer whorls. Therefore the arch/whorl index of Dankmeijers is almost without exception higher in females. This Arch/Whorl index is contrary to the observation of Ramana Rao in the Dermatoglyphic study of Raj Gonds and Kolams (1974) of Adilabad, among whom the females possess lesser frequency of arches. The Furuhata's index in males (126.68) is much higher than in females (99.34). This is because of the occurrence of more whorls and less loops in males and less whorls and more loops in females.

Bimanuar: - Heinrich poll (1933) showed that indices are not adequate to show the three fold pattern (arch, loop and whorl) of finger prints. He proposed the construction of bimanuars in which the digital patterns could be shown in a triangular pyramid. Accordingly bimanuars are constructed and shown separately in Figures I and II for males and females.

Contd...13

This is a table for the entry of all possible combinations of the numbers of whorls and loops in the finger print sets of the individuals composing a series. The space 0 whorls - 0 Loops provide for ten finger sets having arches only; the space 1 whorl - 0 loops represents individuals with nine arches and so on. The bimanuar for males show 2 highest peaks at 10W0L(11.94%) and 4W 6L (11.94%) and it shows 11 lowest peaks at 8W 0L, 6W 2L, 6W 3L, 1W 4L, 4W 5L, 3W 5L, 2W 5L, 2W 6L, 1W 7L, 0W 7L, 0W 8L with a frequency of 1.49% each. The other combinations are 9W 1L with 7.47%, 8W 1L with 4.48% 8W 2L with 5.97%, 7W 3L with 10.45%, 6W 4L with 7.47% 5W 5L with 5.97% 3W 6L with 4.48%, 3W 7L with 7.46% 1W 9L with 2.99% and 0W 10L with 2.99%. In females, the bimanuar shows 1 highest peak (12.73%) at 5W 5L and 11 lowest peaks at 9W 1L, 7W 2L, 3W 6L, 3W 6L, 2W 7L, 1W 7L, 2W 8L, 1W 8L, 0W 8L, 0W 9L with a frequency of 1.82% each. The other combinations in females are 10W 0L with 9.09% 8W 2L with 5.45%, 7W 3L with 9.09%, 6W 4L with 9.04%, 5W 3L, 5W 4L, 4W 6L, 3W 7L, 1W 9L with 5.45%, 0W 7L with 3.64% and 0W 10L with 3.64%.

Monomorphic hands:

The distribution of monomorphic hands i.e., hands in which all digits bear the same pattern type are presented in Table No.5.

Table No: 5

Contd...14

Bimanuar Tales - 67

10	1194																			
9		747																		
8	149	418	597																	
7				1045																
6			149	149	747															
5									597											
4										149	1194									
3											149	418	716							
2											149	149								
1														149						299
0																				299
	0	1	2	3	4	5	6	7	8	9	10									

Totals

Loops

Wholes

10	9.00																			
9		1.82																		
8			5.45																	
7				1.82	9.00															
6					9.00															
5						5.45	5.45													
4								12.73												
3									1.82	1.82										
2											5.45									
1												1.82								
0													1.82							
	0	1	2	3	4	5	6	7	8	9	10									
							1.82	3.64	1.82	1.82	1.82	3.64								
										1.82	5.45									
													1.82	3.64						

Jobs

Bimanuar Jeweler 55.

TABLE NO:5

DISTRIBUTION OF MONOMORPHIC HANDS AMONG THE KONDA REDDYS

Pattern	Males		Females		Rt + Lt	Abs.No.	%	Abs.No.	%	Abs.No.	%	Rt + Lt	
	Right	Left	Right	Left									
Whorls	12	15	7	7	27	20.15	12.73	7	12.73	14	12.73	14	12.73
Loops	7	2	9	4	9	6.72	16.36	4	7.27	13	11.82	13	11.82
Total:-	19	17	16	11	36	13.43	14.54	11	10.00	27	12.27	27	12.27

Contd....17

It is observed from the table that the male hands possess 14.5% and the female hands possess 12.27% of monomorphic hands. The male Konda Reddys possess more number of monomorphic hands than their female counterparts. It is seen from the table that in males, the monomorphic hands with whorls are very higher (20.15%) than the monomorphic hands with loops (6.72%). The frequency of monomorphic left hands with whorls (22.39%) is more than the frequency of monomorphic right hands (17.91). The female Konda Reddys possess less number of monomorphic hands than the males. In females also, it is observed that the monomorphic hands with whorls (12.73%) are higher than the monomorphic hands with loops (11.82%). It is a striking feature here to observe that the frequency of whorls are higher than the loops in males than the females.

Symmetry and Asymmetry:-

The occurrence of symmetry and Asymmetry of Konda Reddys as observed in all digits is presented in Table No.6.

Table No.6.

Contd...18

TABLE NO: 6

OCCURENCE OF SYMMETRY AND ASYMMETRY OF KONDA REDJYS AS OBSERVED IN ALL FIVE DIGITS

Digits	Males			Females		
	Symmetry Abs.No.	Asymmetry Abs.No.	%	Symmetry Abs.No.	Asymmetry Abs.No.	%
I	48	19	28.36	36	17	30.91
II	42	25	37.31	40	15	27.27
III	41	26	38.81	43	12	21.82
IV	46	21	31.34	39	16	29.09
V	49	18	26.87	30	25	45.45
All Digits:-	226	109	32.54	190	85	30.91

From the table it can be known that the male Konda Reddys shows a higher frequency of symmetry (67.46%) than asymmetry (32.54%). When compared to female Konda Reddys, the same pattern is maintained (i.e.) the higher frequency of symmetry (69.09%) than asymmetry (30.91%). It is observed from the table that the degree of symmetry in the decreasing order among the males is V > I > IV > II > III and among females it is III > II > IV > I > V.

Summary & Conclusion:

Dermatoglyphics of Konda Reddy tribe of Maredumilli and Rajavommangi blocks comprising 67 male and 55 female unrelated adults have been analysed in this report.

Sl. No.	Characters	Males	Females
1.	Finger prints	Whorls: 53.13% Loop-R: 7.01% Loop-U: 34.93% Arch : 4.93%	46.91% 7.09% 40.73% 5.27%
2.	Comparitive occurrence of Loops - Whorls	W > L in I & IV digits of both hands and II digit of right hand. L > W in III & V digits of both the hands. W=L in IInd digit in left hand.	W > L in I, II and V digits of both hands. L > W in III and V digits of both hands.
3.	Pattern Intensity Index.	14.82	14.01
4.	Arch-Whorl index	9.27	11.23
5.	Whorl - Loop index	126.68	99.34
6.	Bimanuar	2 highest peaks at 10 WOL (11.94%) and 4W 6L(11.94%)	1 highest peak (12.73%) at 5W 5L.
7.	Monomorphic hand	13.43%	12.27%
8.	Symmetry	67.46%	69.09%
9.	Asymmetry	32.54%	30.91%

Contd...20

PATTERN INTENSITY INDICES OF VARIOUS TRIBAL POPULATIONS
(MALES)

Population	Indices	Author & year
(1)	(2)	(3)
Vettukurumba	12.59	Sarkar 1954
Chenchu	12.98	Rao et al 1973
Uraon	13.05	Verma cited by Singh 1963
Raj Gond	13.20	Rao-et al, 1976
Lambadi	13.28	Gupta et al 1961
V. Kurumba	13.46	Chakravarthi & Mukherjee 1961
Khonds	13.68	Sarkar 1954
Badaga	13.79	Chakravarthi and Mukherjee 1961
Kolam	13.82	Rao et al 1976
Juang	14.06	Sarkar 1954
Sabara	14.07	Sarkar 1954
Kota	14.08	Chakravarthi & Mukherjee 1961
Toda	14.16	Basu 1961
J. Kurumba	14.16	Chkcravarthi & Mukerhee 1961
Irula	14.20	-do-
Adiyans	14.72	Sarkar 1954
Konda Reddy	14.82	Present study
Sholago	15.00	Chakravarthi & Mukherjee 1961
M. Kurumba	15.26	
Orali	15.35	Chakravarthi 1960 cited by Singh
Paniyas	15.67	Sarkar 1954
Kadar	15.89	Chakravarthi 1958

Contd...21

(1)	(2)	(3)
Sabara	11.68	Sarkar 1954
Lambadi	12.24	Gupta et al 1961
J.Kurumba	12.48	Chakravarthi and Mukherjee 1961
Chenchu	13.20	Rao et al 1973
V.Kurumba	13.53	Chakravarthi and Mukherjee 1961
Juangs	13.53	Sarkar 1954
Kota	13.70	Chakravarthi and Mukherjee 1961
Raj Gonds	13.79	Rao et al 1976
Toda	14.09	Basu 1961
Konda Reddy	14.10	Present study
Badaga	14.16	Chakravarthi and Mukherjee 1961
Kadar	14.18	Chakravarthi 1958
Irula	14.25	Chakravarthi & Mukherjee 1961
Urali	14.30	Chakravarthi 1960
M.Kurumba	14.43	Chakravarthi and Mukherjee 1961
Kolam	14.46	Rao et al 1976
Sholaga	16.13	Chakravarthi and Mukherjee 1961.

Contd...22

PAPILARY PATTERNS OF SOME INDIAN TRIBES

Tribe (1)	Sex (2)	Whorls (3)	Loops (4)	Arches (5)	P.I. (6)	Indices (7)	F.I. (8)	Autho (9)
Paniyas	M	57.99	40.72	1.29	15.11	0.777	14.24	Sarkar 1954
Adiyans	M	55.20	42.72	5.03	14.14	9.62	122.33	-do
Vettukuruma	M	52.41	61.11	6.48	12.11	19.99	53.03	-do
Kidar	M	59.18	40.10	0.52	15.19	0.875	144.59	Chakravarthi 1958
	F	47.72	51.77	0.51	14.37	1.07	92.97	-do
	M	43.49	46.51	--	15.49	1.87	115.00	Chakravarthi
	F	45.30	54.43	1.27	14.003	2.87	81.39	1960
Ulladan	M	5.25	67.28	1.28	15.387	4.09	46.45	Gupta 1965
	F	21.65	68.33	3.00	17.563	0.47	41.93	Chakravarthi
Kota	M	42.50	55.00	2.10	14.30	4.80	13.00	1961
	F	42.50	51.60	4.20	17.54	10.19	17.72	Sarkar cited by
Sabara	M	42.40	55.89	1.68	14.07	3.96	99.12	Prasada Rao, 1969
	F	24.72	67.42	7.86	11.68	31.82	66.67	-do-
Saora	M	42.51	54.04	3.72	14.91	8.72	78.66	-do-
Kacnds	M	41.97	52.39	5.14	11.68	10.12	119.02	-do-

Khonds of Arakuvalley	M	29.08	65.26	5.63	12.95	14.74	62.37	Sarkar cited by Prasad Rao, 1969.
Juangas	M	42.00	55.64	1.36	14.06	3.25	74.15	
	F	33.82	57.65	3.54	13.53	9.09	67.34	Sarkar 1954
Uraon	M	36.60	57.30	6.10	13.05	16.66	63.87	Verma 1952
Lambadi	M	38.31	56.18	5.50	13.28	14.36	68.19	Gupta
	F	30.06	62.33	7.61	12.24	25.32	48.23	etal 1961
Toda	M	44.60	52.40	3.00	14.16	6.73	85.17	Basu 1961
	F	47.73	45.45	5.82	14.29	11.93	107.21	
Chenchu	M	35.096	59.654	5.258	12.98	14.99	53.52	
	F	30.172	61.481	2.345	13.38	6.48	53.82	Ramana Rao, 1973.
Konda Reddy	M	53.13	41.94	4.93	14.820	9.27	126.68	
	F	46.91	47.82	5.27	14.104	11.23	99.34	Present study.

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