Chapter-5
MORPHOLOGICAL AND GENETIC CHARACTERISTICS

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CHAPTER- 5

MORPHOLOGICAL AND GENETIC CHARACTERISTICS

Little has been known about morphological and genetical characteristics of Dhimals of India and Nepal as well. Sporadic occurrences of such characteristics have been documented by scholars but without any scientific methodology or even sometimes without any anthropometric measurements. Some arbitrarily described physical characters had mentioned, but due to lack of objectivity the researcher can't find it suitable to use the data to prepare a biological makeup of said population or even for comparison.

The present study compiled collected data on three broad headings, viz. Somatometry, Somatoscopy and Genetic Characters. The characters identified are of great importance to study population variation.

5.1: Somatometry:

Somatometric characters have been used for human classification by the anthropologists. Greater objectivity because of direct measurement as well as non invasive technique (as Somatometry is the measurement of the dimension of human body with soft parts intact) popularize it as a parameter of population variation, though the genetic mechanism or even heredity of the traits is unknown even today. The findings of Dhimal Somatometry (after consideration sex) are tabulated below. The tables are of two types first initial one is meant for statistical constant in the form of Mean, Standard deviation, Covariance and Standard error for each stage. The second one, if any, is the classification of characters and percentage of population within such classes. Care is taken to consider sex differences during classification of somatometric characters. The somatometric characters of Dhimal, by systematic way and/ or total dimension are literally absent on available documents. Hence, this is the first time

attempt to explore such characters of the population. The characteristic features of different measurements are as follows:

5.1.1: Stature:

According to Martin's classification (1928) the stature of Dhimal as a whole are short to below medium. The mean stature is 157.26 cm. (163.23 cm. for male and 151.29 cm. for female). Among them 52% male and 62% female are below and within 'below medium group'. If it extends up to medium the corresponding figures are 74% and 78% respectively. Only 26% male are above medium or tall; the corresponding figure for female is 22%. No single male are found to be very short but 9% female are within such group.

Table: 5.1.1A: Statistical Constants of Stature

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	151.1-176.8	163.23 ± 0.66	6.58 ± 0.47	4.03 ± 0.29
Female (N=100)	139.2-163.5	151.29 ± 0.61	6.06 ± 0.42	4.01 ± 0.28
Total (N=200)	139.2-176.8	157.26 ± 0.61	8.70 ± 0.43	5.53 ± 0.28

Table 5.1.1B: Classification of Stature

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Very Short	Male: 130-149.9 Female: 121-139.9	0 (0%)	7 (7%)	7 (3.5%)
Short	Male: 150-159.9 Female: 140-148.9	34 (34%)	24 (24%)	58 (29%)
Below Medium	Male: 160-163.9 Female: 149-152.9	18 (18%)	31 (31%)	49 (24.5%)
Medium	Male: 164-166.9 Female: 153-155.9	22 (22%)	16 (16%)	38 (19%)
Above Medium	Male: 167-169.9 Female: 156-158.9	11 (11%)	13 (13%)	24 (12%)
Tall	Male: 170-179.9 Female: 159-167.9	15 (15%)	9 (9%)	24 (12%)

Fig 5.1.1 Stature
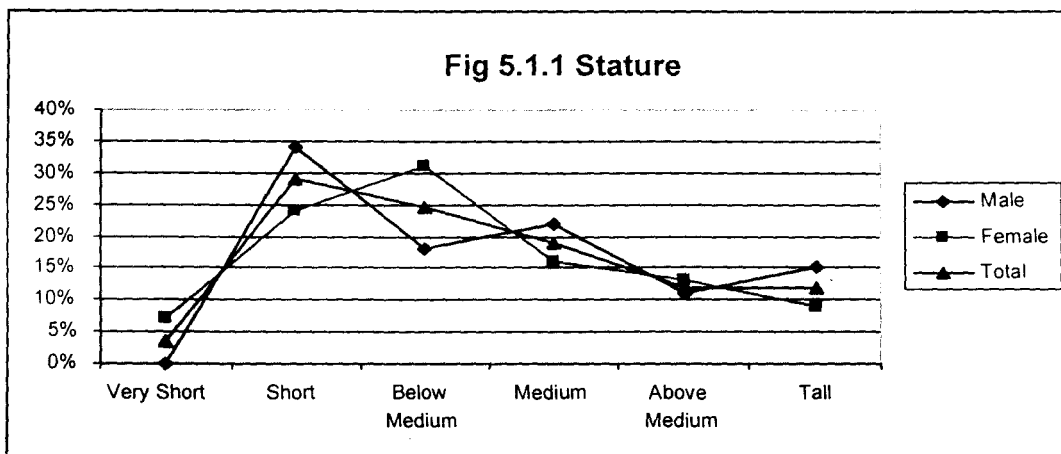
5.1.2: Sitting Height:

Overall mean sitting height of the population is 81.69 cm with marked differences between two sexes: for male it is 85.6 cm and for female it is 77.78 cm. The range of Sitting Height is again higher in case of female (67.2 cm to 92.3 cm) than their male counterpart (77.1 cm to 93.8cm).

Table 5.1.2A: Statistical Constants of Sitting Height

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	77.1-93.8	85.60 ± 0.36	3.55 ± 0.25	4.15 ± 0.29
Female (N=100)	67.2-92.3	77.78 ± 0.47	4.66 ± 0.33	5.99 ± 0.42
Total (N=200)	67.2-93.8	81.69 ± 0.40	5.70 ± 0.28	6.97 ± 0.35

5.1.3: Relative Sitting Height Index:

Overall the Dhimals are Metriocormic (40.5%) followed by Macrocormic (33%) with comparatively lower concentration on Brachycormic (26.5%). However a marked differences between two sexes is evident as male are more Metriocormic (43%) with more or less similar Macrocormic (42%); on the other hand female exhibit equal proportions of Metriocormic and Brachycormic (38% each) followed by Macrocormic (24%). However the mean value of two sexes supposed to differ less having 52.46 for

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male and 51.49 for female. The mean value of Cormic Index (for pooled data) is 51.97 with a range of 47.64 to 59.55.

Table 5.1.3A: Statistical Constants of Relative Sitting Height Vertex (Cormic) Index

	Range	Mean $\pm$ S.E.	S.D.$\pm$ S.E.	C.V. $\pm$ S.E.
Male (N=100)	48.98 - 55.24	52.46 $\pm$ 0.15	1.48 $\pm$ 0.1	2.82 $\pm$ 0.2
Female (N=100)	47.64 – 59.55	51.49 $\pm$ 0.2	2.03 $\pm$ 0.14	3.94 $\pm$ 0.28
Total (N=200)	47.64 – 59.55	51.97 $\pm$ 0.13	1.83 $\pm$ 0.09	3.52 $\pm$ 0.18

Table 5.1.3B: Classification of Relative Sitting Height Vertex (Cormic) Index

Class	Range	Male (%)	Female (%)	Total (%)
Brachycormic	Up to 50.9	15 (15%)	38 (38%)	53 (26.5%)
Metriocormic	51.0-52.9	43 (43%)	38 (38%)	81 (40.5%)
Macrocormic	53 and above	42 (42%)	24 (24%)	66 (33%)

Fig 5.1.2. Relative Sitting Height Vertex (Cormic) Index
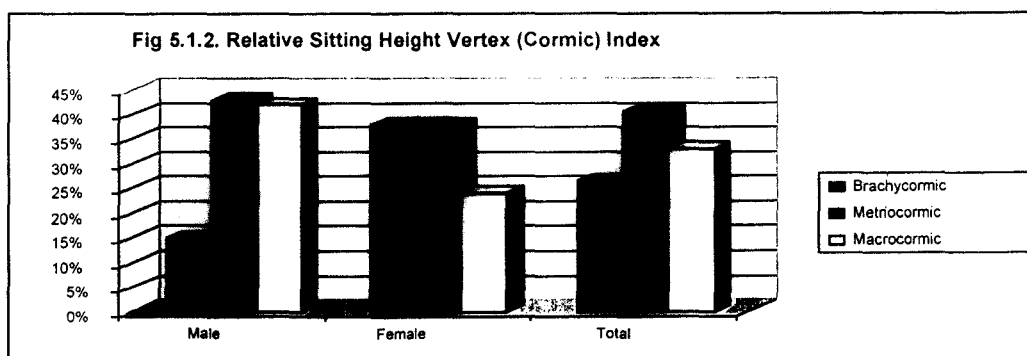
5.1.4: Total Arm Length:

The Total Arm Length varies from 57.4 cm to 78.6 cm. The mean value of Total Arm Length is 68.45 cm; however, it exhibits greater sex differences -in case of male it is 70.67 cm whereas in case of female it is 63.82 cm.

Table 5.1.4A: Statistical Constants of Total Arm Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	58.9-78.6	70.67 ± 0.48	4.76 ± 0.34	6.74 ± 0.48
Female (N=100)	57.4-70.5	63.82 ± 0.34	3.42 ± 0.24	5.36 ± 0.38
Total (N=200)	57.4-78.6	68.45 ± 0.44	5.41 ± 0.27	7.91 ± 0.40

5.1.5: Relative Upper Extremities Index:

Majority of Dhimal (65%) are short armed; male and female with equal proportion (65%) exhibit the criteria. However, in case of proportion of Medium (15%) or Long Armed (20%) there are sex differences but negligible in nature. Overall mean of the Index is 43.06; for male it is 43.27 and for female 42.62.

Table 5.1.5A: Statistical Constants of Relative Upper Extremities Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	37.61-47.01	43.27 ± 0.2	2.00 ± 0.14	4.63 ± 0.33
Female (N=100)	39.01-46.41	42.62 ± 0.2	2.03 ± 0.14	4.77 ± 0.29
Total (N=200)	37.61-47.01	43.06 ± 0.17	2.03 ± 0.10	4.71 ± 0.24

Table 5.1.5B: Classification of Relative Upper Extremities Index

Class	Range	Male (%)	Female (%)	Total (%)
Short Arm	Male: Up to 44 / Female: Up to 43.5	65 (65%)	65 (65%)	130 (65%)
Medium Arm	Male: 44.1-44.5 / Female: 43.6-44	14 (14%)	16 (16%)	30 (15%)
Long Arm	Male: 44.6 and above / Female: 44.1 and above	21 (21%)	19 (19%)	40 (20%)

Fig 5.1.3. Relative Upper Extremities Index
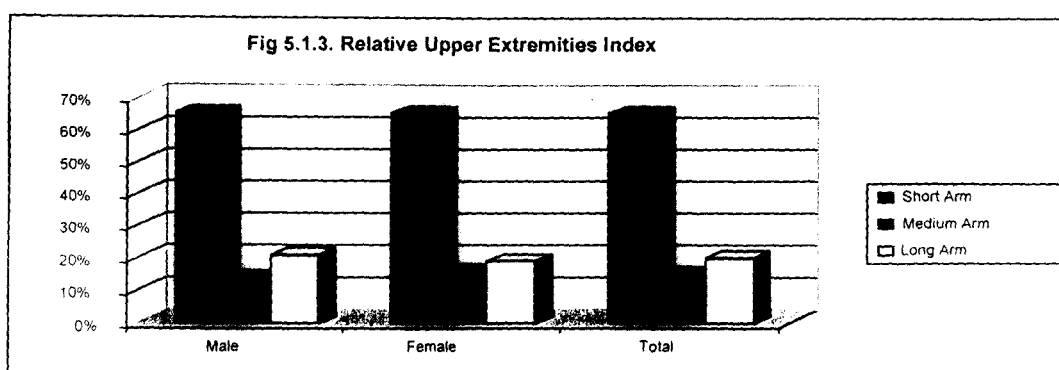
5.1.6: Total Leg Length:

It varies greatly, from 72.1 cm to 105.4 cm. This is because of greater sex differences: females have lower value (mean 80.62 cm) of total leg length compared to their male counterpart (93.36 cm). Overall mean total leg length of the population is 87.12 cm.

Table 5.1.6A: Statistical Constants of Total Leg Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	82.8-105.4	93.36 ± 0.51	5.05 ± 0.36	5.41 ± 0.38
Female (N=100)	72.1-89.3	80.62 ± 0.47	4.75 ± 0.36	5.89 ± 0.42
Total (N=200)	72.1-105.4	87.12 ± 0.57	8.04 ± 0.40	9.23 ± 0.46

5.1.7: Relative Lower Extremities Index:

The Index also exhibit greater sex differences; majority of male (93%) are long legged whereas majority of female (52%) are short legged. Overall 66% of Dhimal are long legged and 18% are short lagged. The mean value is 55.54; for male it is 57.18 and for female 53.83.

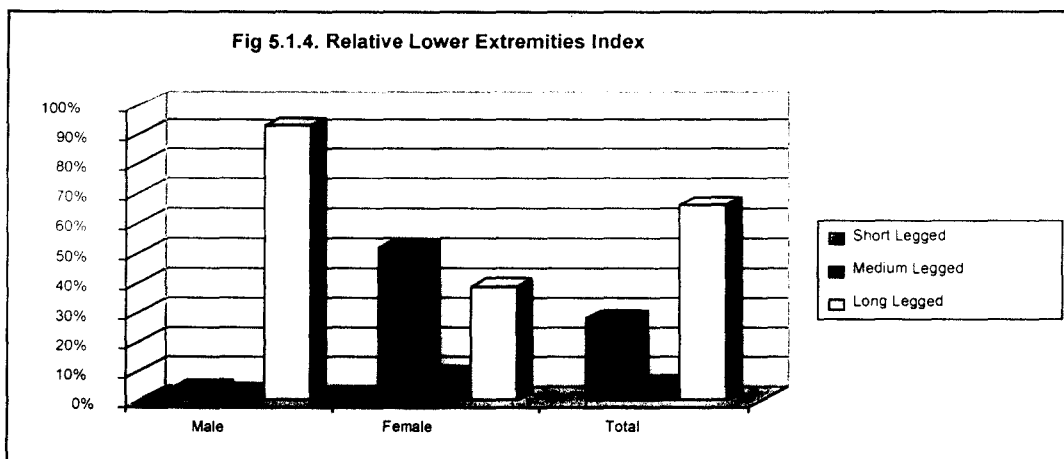### Table 5.1.7A: Statistical Constants of Relative Lower Extremities Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	53.09 -60.78	57.18 ± 0.17	1.71 ± 0.12	2.99 ± 0.21
Female (N=100)	49.34 -58.87	53.83 ± 0.27	2.72 ± 0.19	5.05 ± 0.36
Total (N=200)	49.34 -60.78	55.54 ± 0.20	2.81 ± 0.14	5.06 ± 0.25

Table 5.1.7B: Classification of Relative Lower Extremities Index

Class	Range	Male (%)	Female (%)	Total (%)
Short Legged	Male: Up to 53.5 Female: Up to 54.0	4 (4%)	52 (52%)	56 (28%)
Medium Legged	Male: 53.6-54.0 Female: 54.1-54.5	3 (3%)	9 (9%)	12 (6%)
Long Legged	Male: 54.1 and above Female: 54.6 and above	93 (93%)	39 (39%)	132 (66%)

Fig 5.1.4. Relative Lower Extremities Index

5.1.8: Biacromial Breadth:

The mean Biacromial breadth is 34.30 cm with a range of 27 cm to 39.2 cm. A marked sex differences is there; in case of male it (mean) is 35.62 cm whereas in case of female it is 32.19 cm.

Table 5.1.8A: Statistical Constants of Biacromial Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	31-39.2	35.62 ± 0.30	3.01 ± 0.21	8.44 ± 0.60
Female (N=100)	27-37.2	32.19 ± 0.22	2.22 ± 0.16	6.89 ± 0.49
Total (N=200)	27-39.2	34.30 ± 0.18	2.55 ± 0.13	7.44 ± 0.37

5.1.9: Relative Biacromial Breadth Index:

Unlike Biacromial breadth, Relative Biacromial breadth Index ($\mu = 21.57$) is not so sex biased; for male it is 21.61 and for female 21.49 with more or less similar range. However in respect of classification 67% of male are narrow shoulders compared to 53% female (in total 60% are narrow shoulders).

Table 5.1.9A: Statistical Constants of Relative Biacromial Breadth Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	18.51-23.60	21.61 + 0.12	1.16 + 0.08	5.35 + 0.38
Female (N=100)	18.57-23.69	21.49 + 0.13	1.27 + 0.09	5.92 + 0.42
Total (N=200)	18.51-23.69	21.57 + 0.08	1.19 + 0.06	5.53 + 0.28

Table 5.1.9B: Classification of Relative Biacromial Breadth Index

Class	Range	Male (%)	Female (%)	Total (%)
Narrow Shoulders	Male: Up to 22.0 Female: Up to 21.5	67 (67%)	53 (53%)	120 (60%)
Medium Shoulders	Male: 22.1-23 Female: 21.6-22.5	18 (18%)	24 (24%)	42 (21%)
Broad Shoulders	Male: 23.1 and above Female: 22.6 and above	15 (15%)	23 (23%)	38 (19%)

Fig 5.1.5. Relative Biacromial Breadth Index
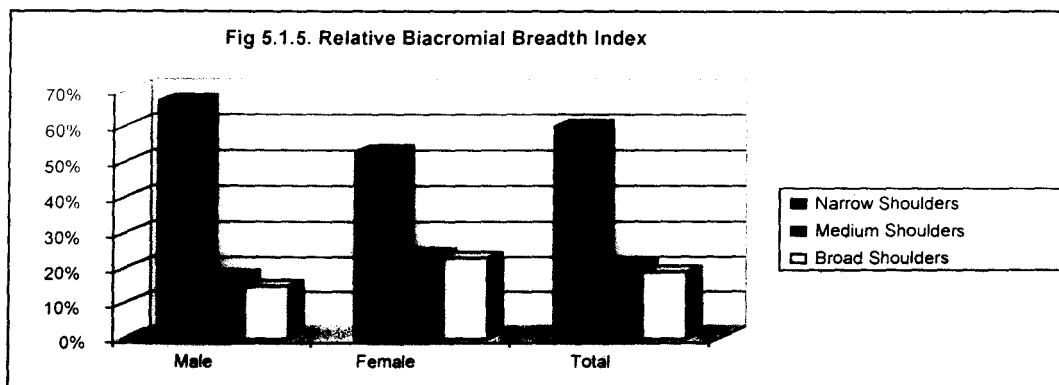
5.1.10: Bicristal Breadth:

The range of Bicristal breadth is 24.2 cm to 35.0 cm. (for male 24.2 cm to 32.0 cm; for female 25.0 cm to 35.0 cm) with a mean of 27.82 cm (27.38 cm for male; 28.73 cm for female). This is the first identified anthropometric characters to have greater value for female than their male counterpart, with is natural in biological sense.

Table 5.1.10A: Statistical Constants of Bicristal Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	24.2-32.0	27.38 + 0.16	1.61 + 0.11	5.78 + 0.42
Female (N=100)	25.0-35.0	28.73 + 0.27	2.67 + 0.19	9.29 + 0.66
Total (N=200)	24.2-35.0	27.82 + 0.15	2.10 + 0.11	7.56 + 0.38

## 5.1.11: Relative Bicristal Breadth Index:

However, unlike previous index, the Relative Bicristal breadth Index is sex biased. In general females are broad pelvic (61%) followed by medium (39%); but for male tendency is toward medium (46%) followed by narrow pelvic (34%). Overall, they are broad pelvic (4.05%) followed by medium (39%). The mean value is 17.56, with 16.78 for male and 19.17 for female.

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Table 5.1.11A: Statistical Constants of Relative Bicristal Breadth Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	14.76-18.71	16.78 + 0.08	0.84 + 0.06	5.03 + 0.36
Female (N=100)	16.59-22.29	19.17 + 0.16	1.55 + 0.11	8.12 + 0.57
Total (N=200)	14.76-22.29	17.56 + 0.11	1.59 + 0.08	9.03 + 0.45

Table 5.1.11B: Classification of Relative Bicristal Breadth Index

Class	Range	Male (%)	Female (%)	Total (%)
Narrow Pelvic	Male: Up to 16.4 Female: Up to 17.4	34 (34%)	7 (7%)	41 (20.5%)
Medium Pelvic	Male: 16.5-17.4 Female: 17.5-18.4	46 (46%)	32 (32%)	78 (39%)
Broad Pelvic	Male: 17.5 and above Female: 18.5 and above	20 (20%)	61 (61%)	81 (40.5%)

Fig 5.1.6.Relative Bicristal Breadth Index
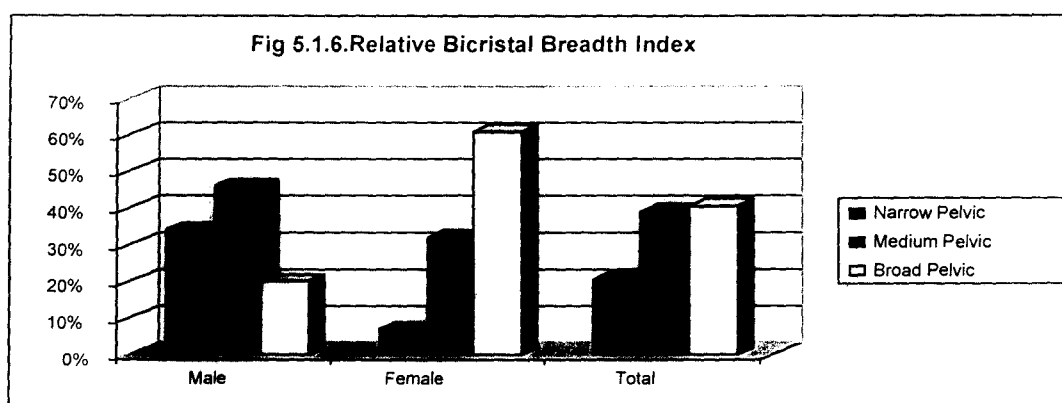
5.1.12: Body Weight:

Body weight and weight related Indices are the anthropometric characters which supposed to influence by environment including food habit and life style. Overall male are heavier (μ = 54.81 kg) than female (μ = 45.11 kg). The overall mean of body weight is 49.96 kg with a wider range of 31 kg to 78 kg.

Table 5.1.12A: Statistical Constants of Body Weight

	Range in kg.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	40-78	54.81 + 0.77	7.67 + 0.52	13.99 + 0.99
Female (N=100)	31-66	45.11 + 0.85	8.47 + 0.60	18.79 + 1.33
Total (N=200)	31-78	49.96 + 0.67	9.41 + 0.47	18.42 + 0.94

5.1.13: Ponderal Index:

The relation between Body weight and Stature indicate that female have more weight than male in respect of their stature. The corresponding mean for male is 70.33, and for female 80.22 (population total μ = 75.12). The range of the Index is also higher; having 54.78 as lower and 97.2 as upper limit.

Table 5.1.13A: Statistical Constants of Ponderal Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	54.78- 85.5	70.03 + 0.63	6.34 + 0.45	9.05 + 0.64
Female (N=100)	61.23- 97.2	80.22 + 0.94	9.44 + 0.67	11.77 + 0.83
Total (N=200)	54.78- 97.2	75.12 + 0.67	9.51 + 0.48	12.66 + 0.63

5.1.14: Body Mass Index:

Body Mass Index or BMI is a widely accepted measure of malnutrition which measures the relation between body weight and stature. The mean BMI of the population is 20.06; in case of male it is 20.51 and for female 19.6. (Further classification of BMI have already stated in chapter 4, under 4.5. Health and Nutrition).

Table 5.1.14A: Statistical Constants of Body Mass Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	16.34-25.88	20.51 + 0.2	2.05 + 0.14	9.99 + 0.71
Female (N=100)	14.80-28.15	19.6 + 0.28	2.85 + 0.2	14.53 + 1.03
Total (N-200)	14.80-28.15	20.06 + 0.18	2.52 + 0.13	12.55 + 0.63

Fig 5.1.7: Body Mass Index (WHO, 1995)
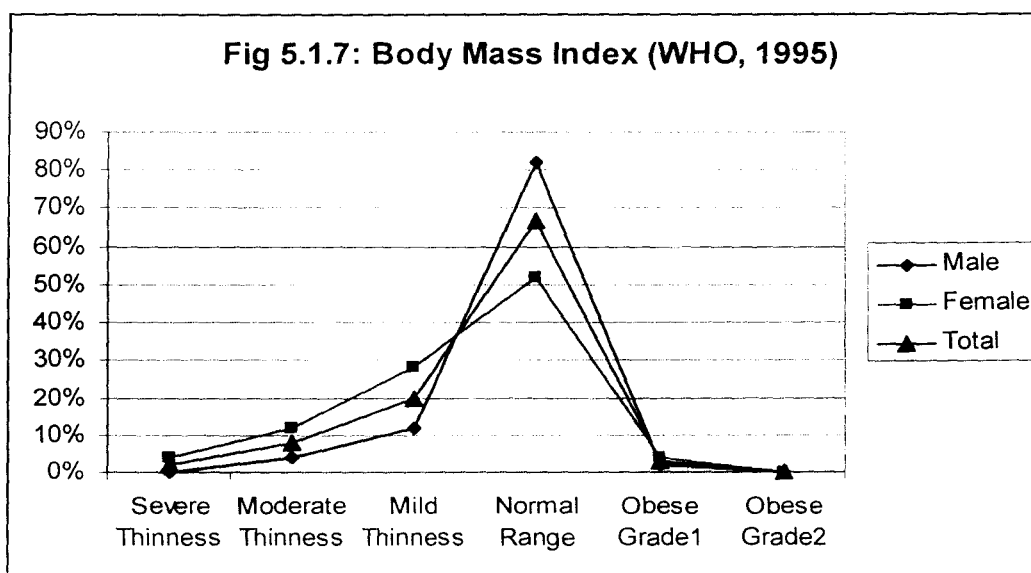
5.1.15: Upper Arm Length:

The Upper Arm Length (μ =28.02 cm) is again sex biased; for male the mean stands for 29.08 cm and for female 25.82 cm. The range of the measurement is also greater; the lower being 20.1 cm and upper as 33.5 cm.

Table 5.1.15A: Statistical Constants of Upper Arm Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	20.1- 33.5	29.08 + 0.28	2.76 + 0.2	9.49 + 0.67
Female (N=100)	21.1- 31.0	25.82 + 0.21	2.10 + 0.15	8.12 + 0.57
Total (N=200)	20.1- 33.5	28.02 + 0.21	2.98 + 0.15	10.64 + 0.53

5.1.16: Forearm Length:

The forearm length exhibit less sex biased than upper arm; for male it is 24.26 cm and for female 22.49 with a population mean of 23.68 cm. However the range is again higher, the lower being 19.0 cm and upper as 30.2 cm.

Table 5.1.16A: Statistical Constants of Forearm Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	19.3- 30.2	24.26 + 0.24	2.37 + 0.17	9.77 + 0.69
Female (N=100)	19.0- 26.5	22.49 + 0.19	1.87 + 0.13	8.33 + 0.59
Total (N=200)	19.0- 30.2	23.68 + 0.17	2.36 + 0.12	9.98 + 0.50

5.1.17: Hand Length:

The populations mean stands for 16.79 cm with male as 17.36 cm and female as 16.22 cm. The range of the population in respect of Hand length is wide, having 12.6 cm as lower limit and 20.9 cm as upper limit.

Table 5.1.17A: Statistical Constants of Hand Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	12.6- 20.9	17.36 + 0.13	1.34 + 0.09	7.71 + 0.55
Female (N=100)	13.1- 20.5	16.22 + 0.14	1.44 + 0.10	8.87 + 0.63
Total (N=200)	12.6- 20.9	16.79 + 0.11	1.50 + 0.07	8.92 + 0.45

5.1.18: Hand Breadth:

Like Hand length the breadth of the hand is also greater for male (μ =8.07 cm) than their female counterpart (μ = 7.14 cm). Overall mean of the population is 7.60 cm with a lower range of 6.3 cm to as wide as 9.1 cm.

Table 5.1.18A: Statistical Constants of Hand Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	7.1- 9.1	8.07 + 0.04	0.41 + 0.03	5.07 + 0.36
Female (N=100)	6.3- 7.9	7.14 + 0.04	0.42 + 0.03	5.92 + 0.42
Total (N=200)	6.3- 9.1	7.60 + 0.04	0.62 + 0.03	8.20 + 0.41

5.1.19: Length-Breadth Index of Hand:

The distribution of Hand Index exhibits a more or less normal curve distribution having 30% Mesocheir with 28% Dolichocheir, 29.5% Brachycheir and negligible percentages of hyper group for each stage. However, a small acceleration towards Brachycheir for male and Dolichocheir for female is observed. Overall mean calculated as 45.33 (46.43 for male, 44.22 for female) with a range of 37.30 to 51.61.

Table 5.1.19A: Statistical Constants of Length-Breadth Index of Hand

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	41.04- 51.61	46.43 + 0.29	2.87 + 0.20	6.17 + 0.44
Female (N=100)	37.30- 49.68	44.22 + 0.32	3.24 + 0.32	7.32 + 0.52
Total (N=200)	37.30- 51.61	45.33 + 0.23	3.24 + 0.16	7.16 + 0.36

Table 5.1.19B: Classification of Length-Breadth Index of Hand

Class	Range	Male (%)	Female (%)	Total (%)
Hyperdolichocheir	Up to 40.9	0 (0%)	15 (15%)	15 (7.5%)
Dolichocheir	41.0- 43.9	25 (25%)	31 (31%)	56 (28%)
Mesocheir	44.0- 46.9	29 (29%)	31 (31%)	60 (30%)
Brachycheir	47.0- 49.9	36 (36%)	23 (23%)	59 (29.5%)
Hyperbrachyeir	50.0 and above	10 (10%)	0 (0%)	10 (5%)

Fig.5.1.8: Length-Breadth Index of Hand
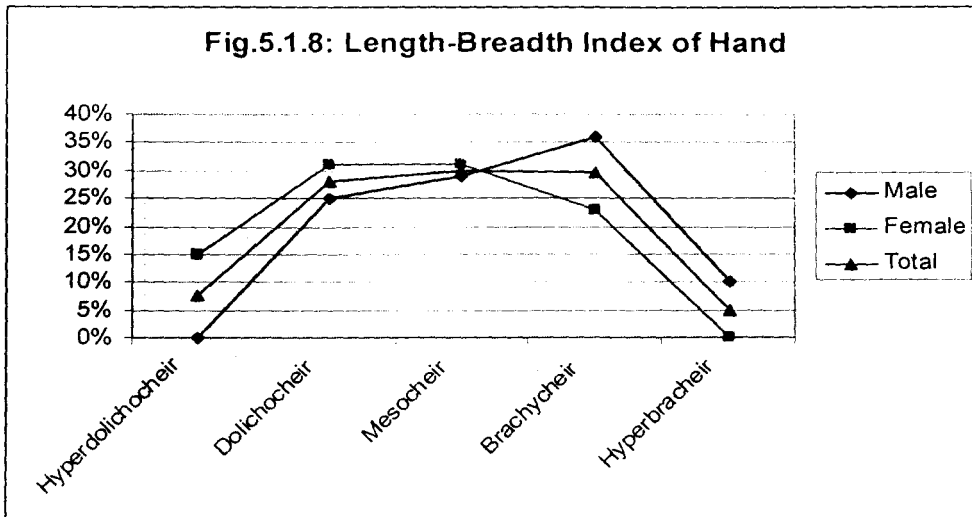
5.1.20: Thigh Length:

Male have a greater mean thigh length (46.72 cm) compared to their female counterpart (37.57 cm). The population mean for thigh length is 43.75 cm with a wider range having 31.2 cm as lower range and 52.8 cm as upper. The wider range is because of male (having the same range as total) than female (having less range 31.4 cm to 43.8 cm).

Table 5.1.20A: Statistical Constants of Thigh Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	31.2- 52.8	46.72 + 0.45	4.45 + 0.31	9.53 + 0.67
Female (N=100)	31.4- 43.8	37.57 + 0.35	3.49 + 0.25	9.29 + 0.66
Total (N=200)	31.2- 52.8	43.75 + 0.42	5.98 + 0.30	13.66 + 0.68

5.1.21: Tibial Length:

Tibial length also exhibit greater mean for male (39.97cm) than their female counterpart (37.07 cm), but not so as thigh length. The mean of the population is 39.03 cm with a range of 32.3 cm as lower and 48.0 cm as upper limit.

Table 5.1.21A: Statistical Constants of Tibial Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	33.7- 48.0	39.97 + 0.36	3.64 + 0.26	9.11 + 0.64
Female (N=100)	32.3- 41.9	37.07 + 0.26	2.59 + 0.18	6.97 + 0.49
Total (N=200)	32.3- 48.0	39.03 + 0.25	3.59 + 0.18	9.21 + 0.46

5.1.22: Foot Length:

The mean foot length of the population is 23.05 cm with 23.92 cm as mean for male and 22.17 cm as mean for female. The distribution is also wide having 19.0 cm as lower range and 28.2 cm as upper range.

Table 5.1.22A: Statistical Constants of Foot Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	21.1 – 28.2	23.92 + 0.15	1.48 + 0.1	6.19 + 044
Female (N=100)	19.0 – 25.5	22.17 + 0.15	1.50 + 0.1	6.77 + 0.48
Total (N=200)	19.0 – 28.2	23.05 + 0.12	1.73 + 0.09	7.49 + 0.37

5.1.23: Foot Breadth:

Foot breadth (population μ = 9.52 cm) also exhibit the same trend (as length) having 10.01 cm as mean for male and 9.03 cm as mean for female. The lower range of the character is 7.8 cm whereas for upper range it is 11.4 cm.

Table 5.1.23A: Statistical Constants of Foot Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	8.1 – 11.4	10.01 + 0.07	0.74 + 0.05	7.39 + 0.52
Female (N=100)	7.8 – 10.3	9.03 + 0.06	0.57 + 0.04	6.35 + 0.45
Total (N=200)	7.8 - 11.4	9.52 + 0.06	0.82 + 0.04	8.65 + 0.43

5.1.24: Foot Index:

Most of the people are brachypod or having broad foot (53.5%) followed by mesopod or medium (39.5%). Female exhibit greater number of brachypod (60%) than male (47%) followed by mesopod (33% and 46% respectively). Overall mean of the population is 41.3 (male 41.84 and female 40.76) with a range of 35.22 to 47.55.

Table 5.1.24A: Statistical Constants of Foot Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	35.22- 47.50	41.84 + 0.27	2.7 + 0.19	6.46 + 0.46
Female (N=100)	35.87- 44.55	40.76 + 0.19	1.9 + 0.13	4.65 + 0.33
Total (N=200)	35.22- 47.50	41.30 + 0.17	2.39 + 0.12	5.79 + 0.29

Table 5.1.24B: Classification of Foot Index

Class	Range	Male (%)	Female (%)	Total (%)
Narrow (dolichopod)	Up to 37.9	7 (7%)	7 (7%)	14 (7%)
Medium (mesopod)	38.0-40.9	33 (33%)	46 (46%)	79 (39.5%)
Broad (brachypod)	41.0 and above	60 (60%)	47 (47%)	107 (53.5%)

Fig 5.1.9: Foot Index
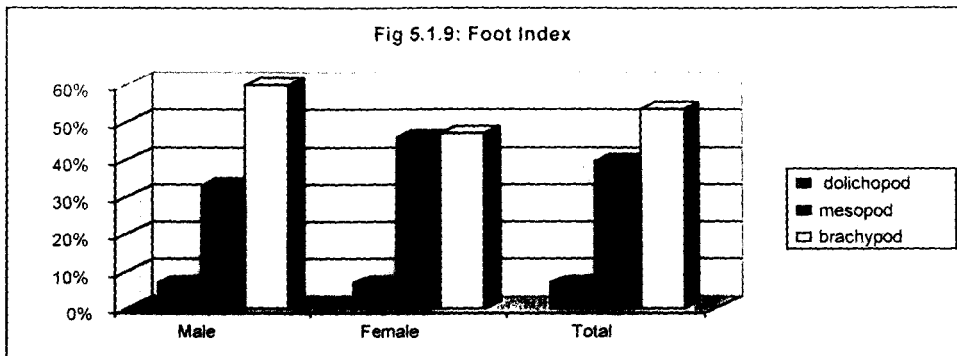
5.1.25: Head Length:

The Head length of majority of the population are long (32% long and 12% very long) with a tendency towards medium (36%). A moderate sex difference is there; in case of male the medium (40%) is highest followed by long (27%), and in case of female it is long (37%) followed by medium (32%). Overall mean of the population is 18.05 cm (male 18.48 cm and female 17.62 cm) with a range of 16.4 cm to 21.3 cm.

Table 5.1.25A: Statistical Constants of Head Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	16.8-21.3	18.48 + 0.09	0.95 + 0.07	5.12 + 0.36
Female (N=100)	16.4-19.2	17.62 + 0.07	0.72 + 0.05	4.11 + 0.29
Total (N=200)	16.4-21.3	18.05 + 0.07	0.94 + 0.05	5.23 + 0.26

Table 5.1.25B: Classification of Head Length

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Very Short	Male: up to 16.9 Female: up to 16.1	5 (5%)	0 (0%)	5 (2.5%)
Short	Male: 17.0-17.7 Female: 16.2-16.9	17 (17%)	18 (18%)	35 (17.5%)
Medium	Male: 17.8-18.5 Female: 17.0-17.6	40 (40%)	32 (32%)	72 (36%)
Long	Male: 18.6-19.3 Female: 17.7-18.4	27 (27%)	37 (37%)	64 (32%)
Very Long	Male: 19.4 and above Female:18.5 and above	11 (11%)	13 (13%)	24 (12%)

Fig.5.1.10: Head Length
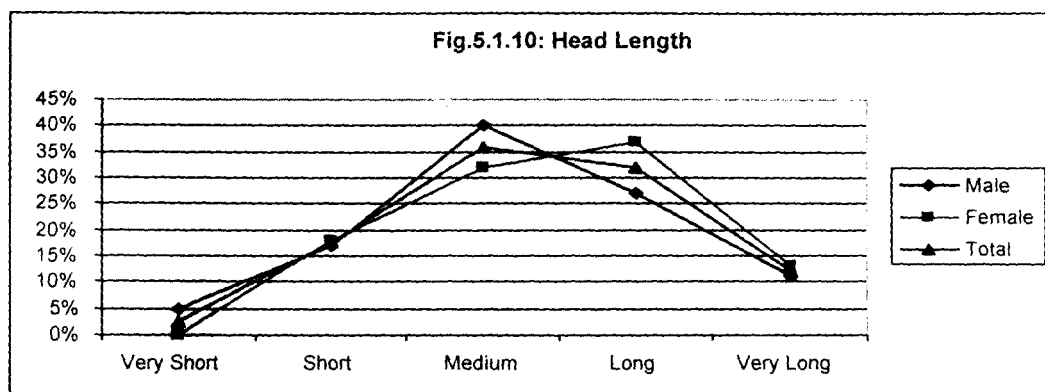
5.1.26: Head Breadth:

The Head breadths of the population indicate greater concordance between two sexes. Three of the five groups (very narrow, narrow and medium) exhibit the same proportion of individual for male and female (12%, 32% and 34% respectively). The male and female group each and populations as a whole exhibit narrow breadth of Head (32% narrow and 12% very narrow) with a tendency towards medium (34%). The population mean of the character is 14.59 cm (14.88 cm for male and 14.31 cm for female) with 12.0 cm as lower range and 17.2 cm as upper range.

Table 5.1.26A: Statistical Constants of Head Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	12.0-17.2	14.88 + 0.11	1.12 + 0.08	7.53 + 0.53
Female (N=100)	12.2-16.3	14.31 + 0.08	0.77 + 0.05	5.41 + 0.38
Total (N=200)	12.0-17.2	14.59 + 0.07	1.00 + 0.05	5.00 + 0.25

Table 5.1.26B: Classification of Head Breadth

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Very Narrow	Male: up to 13.9 Female: up to 13.4	12 (12%)	12 (12%)	24 (12%)
Narrow	Male: 14.0-14.7 Female: 13.5-14.1	32 (32%)	32 (32%)	64 (32%)
Medium	Male: 14.8-15.5 Female: 14.2-14.9	34 (34%)	34 (34%)	68 (34%)
Broad	Male: 15.6-16.3 Female: 15.0-15.7	15 (15%)	18 (18%)	33 (16.5%)
Very Broad	Male: 16.4 and above Female: 15.8 and above	7 (7%)	4 (4%)	11 (5.5%)

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Fig.5.1.11:Head Breadth
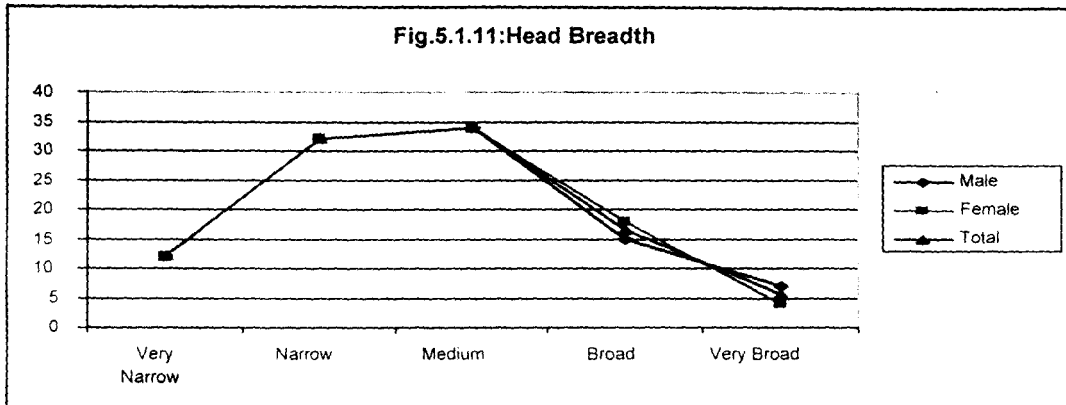
5.1.27: Cephalic Index:

Cephalic Index of the population also exhibit greater concordance between two sexes but not so as head breadth, because of variable head length. Majority of the people are Brachycephalic (34% Brachycephalic, 8% Hyperbrachycephalic and 4% Ultrabrachycephalic) with a tendency towards Mesocephalic (39.5%). However, in case of female Mesocephalic head (47%) predominates over Brachycephalic (33%, 9% and 1% respectively for each group), whereas male exhibit more Brachycephalic (35%, 7% and 7% respectively) than Mesocephalic (32%). The mean value of the population is 81.02 (male μ = 80.74 and female μ = 81.29) with 69.3 as lower range and 96.27 as upper range.

Table 5.1.27A: Statistical Constants of Cephalic Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	69.3-96.27	80.74 + 0.57	5.70 + 0.40	7.05 + 0.50
Female (N=100)	75.0-94.77	81.29 + 0.45	4.49 + 0.32	5.52 + 0.39
Total (N=200)	69.3-96.27	81.02 + 0.36	5.12 + 0.26	6.32 + 0.32

Table 5.1.27B: Classification of Cephalic Index

Class	Range	Male (%)	Female (%)	Total (%)
Hyperdolichocephalic	Male: up to 70.9 Female: up to 71.9	6 (6%)	0 (0%)	6 (3%)
Dolichocephalic	Male: 71-75.9 Female: 72-76.9	13 (13%)	10 (10%)	23 (11.5%)
Mesocephalic	Male: 76-80.9 Female: 77-81.9	32 (32%)	47 (47%)	79 (39.5%)
Brachycephalic	Male: 81-85.4 Female: 82-86.4	35 (35%)	33 (33%)	68 (34%)
Hyperbrachycephalic	Male: 85.5-90.9 Female: 86.5-91.9	7 (7%)	9 (9%)	16 (8%)
Ultrabrachycephalic	Male: 91 and above Female: 92 and above	7 (7%)	1 (1%)	8 (4%)

Fig.5.1.12 Cephalic Index
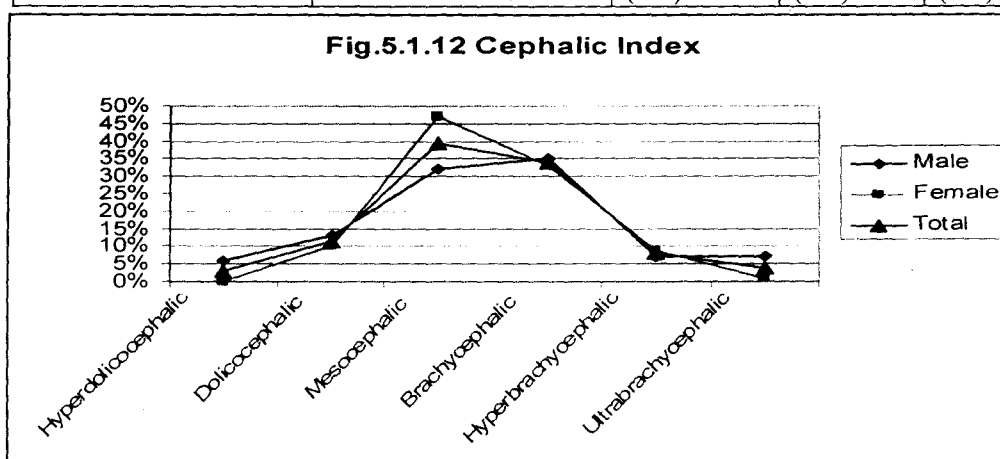
5.1.28: Horizontal Circumference of the Head:

The population mean of Horizontal Circumference of Head is 54.35 cm with a lower limit of 50 cm and upper as 58.8 cm. Like other measurements sex differences may have seen; for male it is 55.10 cm and for their female counterpart it is 53.60 cm.

Table 5.1.28A: Statistical Constants of Horizontal Circumference of Head

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	52.0-58.8	55.10 + 0.16	1.62 + 0.11	2.94 + 0.21
Female (N=100)	50.0-57.1	53.60 + 0.18	1.79 + 0.13	3.34 + 0.24
Total (N=200)	50.0-58.8	54.35 + 0.13	1.86 + 0.09	3.42 + 0.17

5.1.29: Morphological Facial Height:

Morphological facial height of the population as a whole exhibit low height (51.5% very low and 20.5% low) followed by very few medium (15.5%) or high (11.5% high and 1% very high) group. Male and female have more or less similar trend except male have higher concentration of Low group (54% very low and 25% low) than female (49% very low and 16% low), which in turn shows small acceleration of high facial height (19% high and 2% very high) compared to their male counterpart (4% high). The mean value of the population is 10.79 cm with a range of 8.8 cm to 12.8 cm. The corresponding mean for male and female are 11.20 cm and 10.38 cm respectively.

Table 5.1.29A: Statistical Constants of Morphological Facial Height

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	10.1-12.8	11.20 + 0.06	0.62 + 0.04	5.54 + 0.39
Female (N=100)	8.8-12.1	10.38 + 0.08	0.85 + 0.06	8.18 + 0.58
Total (N=200)	8.8-12.8	10.79 + 0.06	0.85 + 0.04	7.86 + 0.39

Table 5.1.29B: Classification of Morphological Facial Height

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Very Low	Male: up to 11.1 Female: up to 10.2	54 (54%)	49 (49%)	103 (51.5%)
Low	Male: 11.2-11.7 Female: 10.3-10.7	25 (25%)	16 (16%)	41 (20.5%)
Medium	Male: 11.8-12.3 Female: 10.8-11.3	17 (17%)	14 (14%)	31 (15.5%)
High	Male: 12.4-12.9 Female: 11.4-11.9	4 (4%)	19 (19%)	23 (11.5%)
Very High	Male: 13 and above Female: 12 and above	0 (0%)	2 (2%)	2 (1%)

Fig.5.1.13: Morphological Facial Height
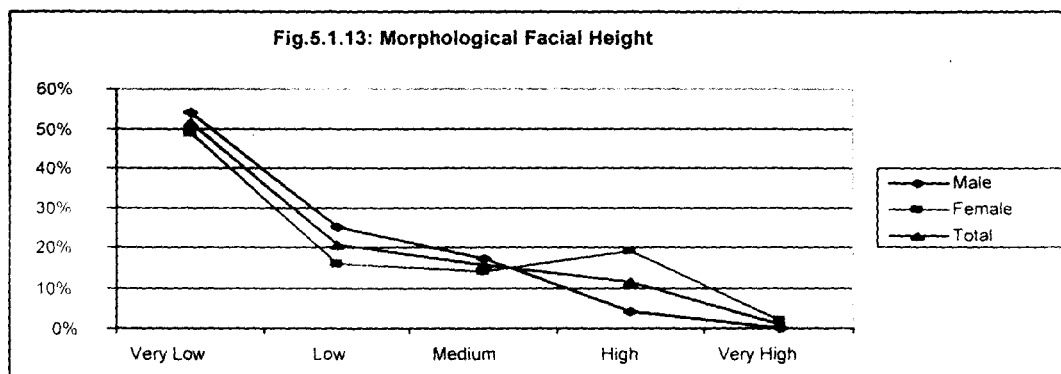
5.1.30: Morphological Facial Index:

Marked differences may have seen between two sexes in respect of Morphological Facial Index. Male may be categorized as Euryprosopic (27% Hyper Euryprosopic and 29% Euryprosopic) with a tendency towards Mesoprosopic (24%); however, for female both Euryprosopic (31% Hypereuryprosopic and 11%eueyprosopic) and Leptoprosopic (31% Hyperleptoprosopic and 13% Leptoprosopic) may found with more or less equal proportions. Overall 49% of the people are Euryprosopic (29% Hypereuryprosopic and 20% Euryprosopic) followed by Leptoprosopic (Hyperleptoprosopic 20% and Leptoprosopic 12%). The mean value of the population is 83.32 (for male 82.96 and for female 83.63) with a wide range of 68.72 to 99.03.

Table 5.1.30A: Statistical Constants of Morphological Facial Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	68.72-97.60	82.96 + 0.69	6.87 + 0.49	8.28 + 0.59
Female (N=100)	70.40-99.03	83.63 + 0.94	9.43 + 0.67	11.28 + 0.80
Total (N=200)	68.72-99.03	83.32 + 0.68	9.64 + 0.48	11.57 + 0.58

Table 5.1.30B: Classification of Morphological Facial Index

Class	Range	Male (%)	Female (%)	Total (%)
Hypereuryprosopic	Male: Up to 78.9 Female: Up to 76.9	27 (27%)	31 (31%)	58 (29%)
Euryprosopic	Male: 79-83.9 Female: 77-80.9	29 (29%)	11 (11%)	40 (20%)
Mesoprosopic	Male: 84-87.9 Female: 81-84.9	24 (24%)	14 (14%)	38 (19%)
Leptoprosopic	Male: 88-92.9 Female: 85-89.9	11 (11%)	13 (13%)	24 (12%)
Hyperleptoprosopic	93 and above 90 and above	9 (9%)	31 (31%)	40 (20%)

Fig.5.1.14: Morphological Facial Index
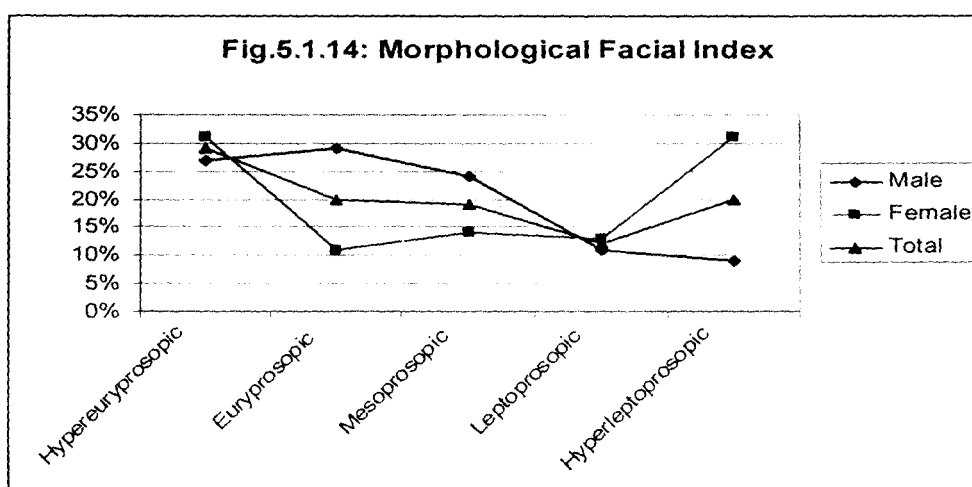
5.1.31: Morphological Upperfacial Height:

The ranges of upper facial height for both sexes are similar (4.2 cm to 7.5 cm) though the mean value for male (6.5 cm) is somewhat greater than female (6.04 cm). Overall population mean of the character is 6.27 cm.

Table 5.1.31A: Statistical Constants of Morphological Upper Facial Height

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	4.2-7.5	6.50 + 0.06	0.63 + 0.04	9.64 + 0.68
Female (N=100)	4.2-7.5	6.04 + 0.09	0.87 + 0.06	14.42 + 1.02
Total (N=200)	4.2-7.5	6.27 + 0.06	0.79 + 0.04	12.60 + 0.63

5.1.32: Morphological Upperfacial Index:

Morphological Upperfacial Index of the population is again exhibit marked differences between two sexes. Altogether 44% male are Euryn (27% Euryn and 17% Hypereuryn) followed by Mesen (37%); female are also more Euryn (35% Hypereuryn and 19% Euryn) but followed by Hyperlepten (26%). Overall they are Euryn (26% Hypereuryn and 23% Euryn) followed by Mesen (23.5%). The mean value of the population is 48.83 (48.43 for male, 49.24 for female) with a wide range of 38.87 to 61.79.

Table 5.1.32A: Statistical Constants of Morphological Upper Facial Index

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	37.87- 60.00	48.43 + 0.53	5.29 + 0.37	10.92 + 0.77
Female (N=100)	40.12- 61.79	49.24 + 0.82	8.19 + 0.58	16.63 + 1.18
Total (N=200)	37.87- 61.79	48.83 + 0.49	6.89 + 0.34	14.11 + 0.71

Table 5.1.32B: Classification of Morphological Upper Facial Index

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Hypereuryn	Up to 42.9	17 (17%)	35 (35%)	52 (26%)
Euryn	43.0- 47.9	27 (27%)	19 (19%)	46 (23%)
Mesen	48.0-52.9	37 (37%)	10 (10%)	47 (23.5%)
Lepten	53.0- 56.9	11 (11%)	10 (10%)	21 (10.5%)
Hyperlepten	57.0 and above	8 (8%)	26 (26%)	34 (17%)

Fig.5.1.15: Morphological Upper Facial Index
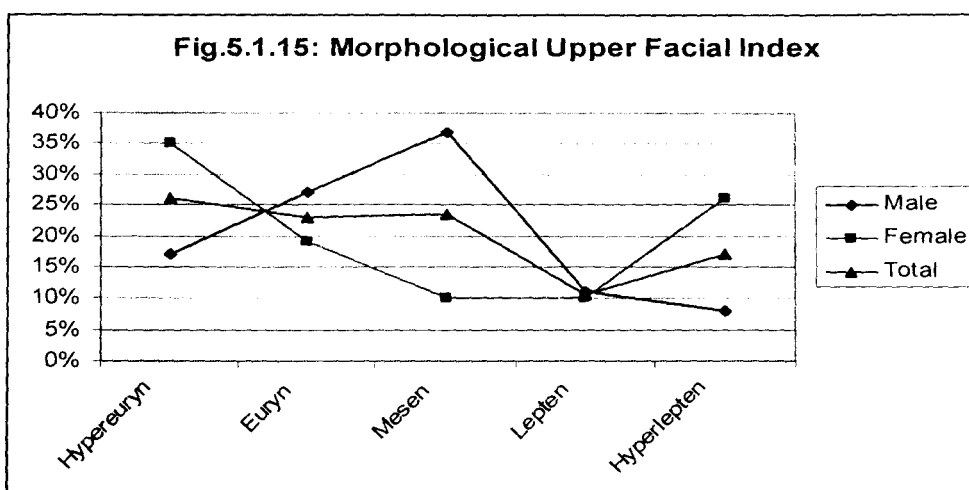
5.1.33: Bizygomatic Breadth:

The ranges of the character of two sexes differ greatly; for male it is 12.1 cm to 16.9 cm but for female it is within 9.4 cm to 14.2 cm. However the difference of mean is about 1.21 cm; for male it is 13.55 cm and for female 12.34 cm. The mean value of the whole population is 12.95 cm.

Table 5.1.33A: Statistical Constants of Bizygomatic Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	12.1-16.9	13.55 + 0.08	0.83 + 0.06	6.13 + 0.43
Female (N=100)	9.4-14.2	12.34 + 0.11	1.13 + 0.08	9.18 + 0.65
Total (N=200)	9.4-16.9	12.95 + 0.08	1.16 + 0.06	8.96 + 0.45

5.1.34: Bigonial Breadth:

The mean of the population is 10.10 cm with a wider range of 7.9 cm as lower limit and 13.7 cm as upper limit. The corresponding mean of Bigonial length for male and female are 10.55 cm and 9.66 cm respectively.

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Table 5.1.34A: Statistical Constants of Bigonial Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	7.9- 13.7	10.55 + 0.1	0.98 + 0.07	9.28 + 0.66
Female (N=100)	8.0- 11.4	9.66 + 0.07	0.73 + 0.05	7.52 + 0.53
Total (N=200)	7.9- 13.7	10.10 + 0.07	0.97 + 0.05	9.58 + 0.48

5.1.35: Minimum Frontal Breadth:

The differences of mean of two sexes is 0.87 cm only; for male 10.92 cm whereas for female 10.05 cm. The population mean of Minimum frontal breadth is 10.48 cm with 8.5 cm as lower limit and 14.3 cm as upper limit.

Table 5.1.35A: Statistical Constants of Minimum Frontal Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	9.2- 14.3	10.92 + 0.10	0.96 + 0.07	8.79 + 0.62
Female (N=100)	8.5- 12.7	10.05 + 0.09	0.99 + 0.07	9.74 + 0.69
Total (N=200)	8.5- 14.3	10.48 + 0.07	1.06 + 0.05	10.11 + 0.51

5.1.36: Biocular Breadth:

The mean Biocular breadth of the population is 10.56 cm with a range of 8.3 cm to 12.9 cm. The corresponding mean of male and female are 11.31 cm and 9.81 cm respectively.

Table 5.1.36A: Statistical Constants of Biocular Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	9.4- 12.9	11.31 + 0.10	1.00 + 0.07	8.84 + 0.44
Female (N=100)	8.3- 11.1	9.81 + 0.07	0.68 + 0.05	6.98 + 0.49
Total (N=200)	8.3- 12.9	10.56 + 0.08	1.14 + 0.06	10.79 + 0.54

5.1.37: Interocular Breadth:

The mean Interocular breadth of the population is 3.11 cm with 3.28 cm as mean for male and 2.95 cm as mean for female. The range of the population is wide, having 2.1 cm as lower limit and 3.8 cm as upper limit.

Table 5.1.37A: Statistical Constants of Interocular Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	2.4- 3.8	3.28 + 0.03	0.30 + 0.02	9.05 + 0.64
Female (N=100)	2.1- 3.7	2.95 + 0.04	0.36 + 0.03	12.11 + 0.86
Total (N=200)	2.1- 3.8	3.11 + 0.03	0.37 + 0.02	11.77 + 0.59

5.1.38: Eye Breadth:

Mean eye breadth of the population is 3.73 cm with a wide range; 2.8 cm as lower limit and 5.0 cm as upper limit. The mean values for male and female in respect of eye breadth of the population are 3.85 cm and 3.6 cm respectively.

Table 5.1.38A: Statistical Constants of Eye Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	2.9- 5.0	3.85 + 0.05	0.51 + 0.04	13.33 + 0.94
Female (N=100)	2.8- 4.5	3.60 + 0.04	0.44 + 0.03	12.14 + 0.86
Total (N=200)	2.8- 5.0	3.73 + 0.03	0.49 + 0.02	13.21 + 0.66

5.1.39: Orbito-Jugular Index:

The mean value of the Orbito-Jugular Index is 81.91 with a wider range: 62.76 cm as lower limit and 99.19 as upper limit. The mean value for male is 83.9 whereas for female it is 79.92.

Table 5.1.39A: Statistical Constants of Orbito-Jugular Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	62.76- 99.19	83.90 + 0.91	9.11 + 0.64	10.86 + 0.77
Female (N=100)	68.42- 94.59	79.92 + 0.69	6.91 + 0.49	8.65 + 0.61
Total (N=200)	62.76- 99.19	81.91 + 0.59	8.31 + 0.42	10.14 + 0.51

5.1.40: Jugo-Mandibular Index:

The differences between two sexes are again greater; in case of male they are of medium (36%) followed by Broad (31%), but female are broad (32% very broad and 12% broad) though concentration on Narrow (29%) or Medium group (24%) may not overlooked. In general they are Broad (21.5% broad and 19.5% very broad) followed by Medium (30%) and then Narrow (24% Narrow and 5% very narrow). Overall mean of the population is 78.26 with a wide range of 58.09 as lower and 98.09 as upper. The corresponding figure (mean) for male and female are 77.89 and 78.63 respectively.

Table 5.1.40A: Statistical Constants of Jugo-Mandibular Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	58.09- 89.93	77.89 + 0.60	6.03 + 0.43	7.74 + 0.55
Female (N=100)	64.55- 98.09	78.63 + 0.85	8.47 + 0.6	10.77 + 0.76
Total (N=200)	58.09- 98.09	78.26 + 0.52	7.34 + 0.37	9.38 + 0.47

Table 5.1.40B: Classification of Jugo-Mandibular Index

Class	Range	Male (%)	Female (%)	Total (%)
Very Narrow	Male: up to 69.9 Female: up to 67.9	7 (7%)	3 (3%)	10 (5%)
Narrow	Male: 70-74.9 Female: 68- 72.9	19 (19%)	29 (29%)	48 (24%)
Medium	Male: 75- 79.5 Female: 73- 77.9	36 (36%)	24 (24%)	60 (30%)
Broad	Male: 80- 84.9 Female: 78-82.9	31 (31%)	12 (12%)	43 (21.5%)
Very Broad	Male: 85 and above Female: 83 and above	7 (7%)	32 (32%)	39 (19.5%)

Fig.5.1.16: Jugo-Mandibular Index
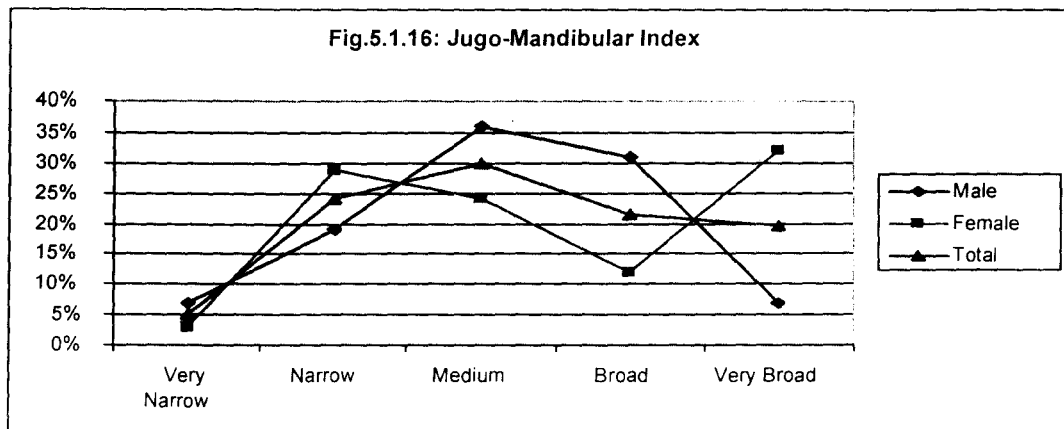
5.1.41: Jugo-Frontal Index:

Jugo-frontal Index is again of greater sex biased; generally male are characterized by Broad (28% Broad and 28% Very Broad) with a tendency towards Medium (26%), female are also Broad (41% Very Broad and 11% Broad) but followed by Narrow (25% Narrow and 17% Very Narrow). In general they are Very Broad in respect of Jugo-frontal Index (34.5% Very Broad and 19.5% Broad) followed by Narrow (15% Narrow and 15% Very Narrow). Overall mean is 81.07 with a range of 64.39 to 95.79. The corresponding mean for male and female are 80.63 and 81.51 respectively.

Table 5.1.41A: Statistical Constants of Jugo-Frontal Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	68.03- 93.62	80.63 + 0.60	5.97 + 0.42	7.40 + 0.52
Female (N=100)	64.39- 95.79	81.51 + 0.95	9.51 + 0.67	11.67 + 0.83
Total (N=200)	64.39- 95.79	81.07 + 0.56	7.93 + 0.40	9.78 + 0.49

Table 5.1.41B: Classification of Jugo-Frontal Index

Class	Range	Male (%)	Female (%)	Total (%)
Very Narrow	Male: up to 69.9 Female: up to 71.9	5 (5%)	25 (25%)	30 (15%)
Narrow	Male: 70-74.9 Female: 72- 76.9	13 (13%)	17 (17%)	30 (15%)
Medium	Male: 75- 79.5 Female: 77- 81.9	26 (26%)	6 (6%)	32 (16%)
Broad	Male: 80- 84.9 Female: 82- 86.9	28 (28%)	11 (11%)	39 (19.5%)
Very Broad	Male: 85 and above Female: 87 and above	28 (28%)	41 (41%)	69 (34.5%)

Fig.5.1.17: Jugo-Frontal Index
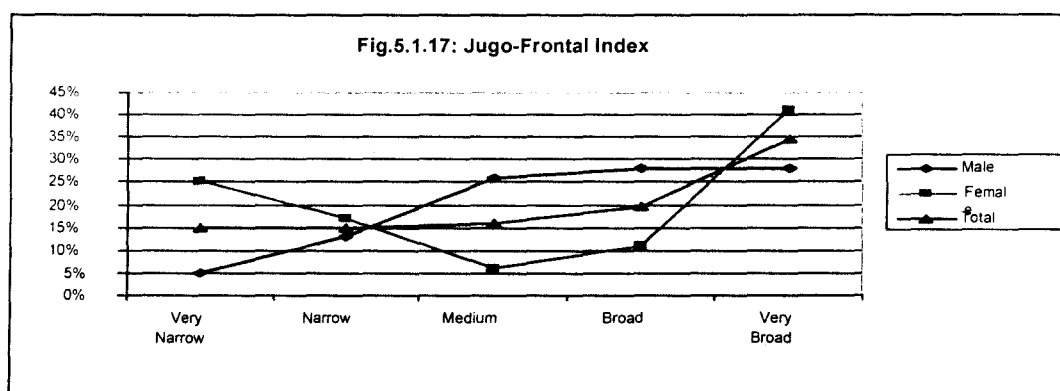
5.1.42: Nasal Height:

Most of the male are below medium (55%) with a tendency of Above Medium (22%), however, female skewed towards Short (43% Short and 21% Very Short). Overall they are Medium (34.5%) to short (31%). The mean value of the population is 4.52 cm with a range of 3.2 cm to 6.5 cm. The mean values for male and female are 4.73 cm and 4.32 cm respectively.

Table 5.1.42A: Statistical Constants of Nasal Height

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	4.0- 6.5	4.73 + 0.05	0.47 + 0.03	9.94 + 0.70
Female (N=100)	3.2- 5.7	4.32 + 0.06	0.63 + 0.04	14.69 + 1.04
Total (N=200)	3.2- 6.5	4.52 + 0.04	0.59 + 0.03	13.13 + 0.66

Table 5.1.42B: Classification of Nasal Height

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Very Short	up to 3.9	0 (0%)	21 (21%)	21 (10.5%)
Short	4.0- 4.4	19 (19%)	43 (43%)	62 (31%)
Below Medium	4.5- 4.9	55 (55%)	14 (14%)	69 (34.5%)
Above Medium	5.0- 5.4	22 (22%)	14 (14%)	36 (18%)
Large	5.5- 5.9	3 (3%)	8 (8%)	11 (5.5%)
Very Large	6.0 and above	1 (1%)	0 (0%)	1 (0.5%)

Fig 5.1.18: Nasal Height
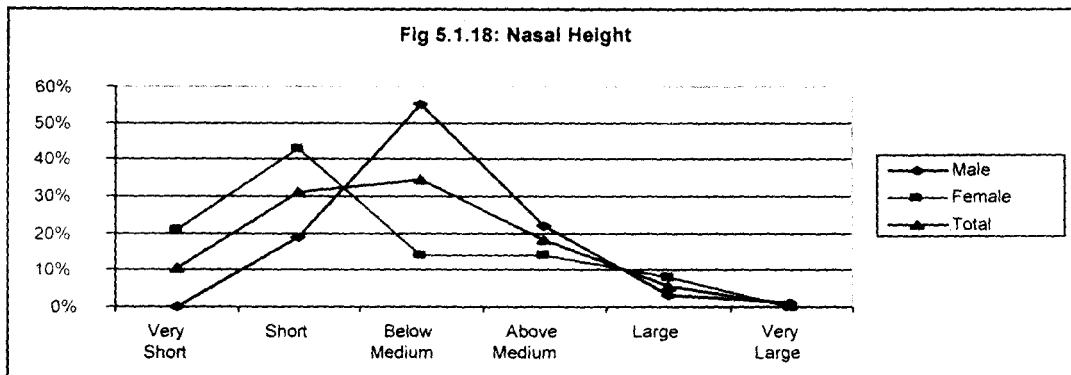
5.1.43: Nasal Breadth:

Nasal Breadth is of definite tendency towards above medium (66%) with a considerable percentage of medium (23.5%). Male heavily concentrated on above medium (77%) with a tendency towards large (14%), however, for female it is above medium (55%) followed by medium (38%). Short or below medium nasal breadth is almost absent (0% for male and 5% below medium for female). The population mean is 3.59 cm with a range of 2.9 cm to 4.4 cm. The corresponding figures of mean nasal breadth for male and female are 3.75 cm and 3.44 cm respectively.

Table 5.1.43A: Statistical Constants of Nasal Breadth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	3.0- 4.4	3.75 + 0.03	0.25 + 0.02	6.67 + 0.47
Female (N=100)	2.9- 4.0	3.44 + 0.03	0.29 + 0.02	8.45 + 0.60
Total (N=200)	2.9- 4.4	3.59 + 0.02	0.31 + 0.02	8.68 + 0.43

Table 5.1.43B: Classification of Nasal Breadth

Class	Range in cm.	Male (%)	Female (%)	Total (%)
Short	Up to 2.4	0 (0%)	0 (0%)	0 (0%)
Below Medium	2.5 – 2.9	0 (0%)	5 (5%)	5 (2.5%)
Medium	3.0 – 3.4	9 (9%)	38 (38%)	47 (23.5%)
Above Medium	3.5 – 3.9	77 (77%)	55 (55%)	132 (66%)
Large	4.0 and above	14 (14%)	2 (2%)	16 (8%)

Fig.5.1.19:Nasal Breadth
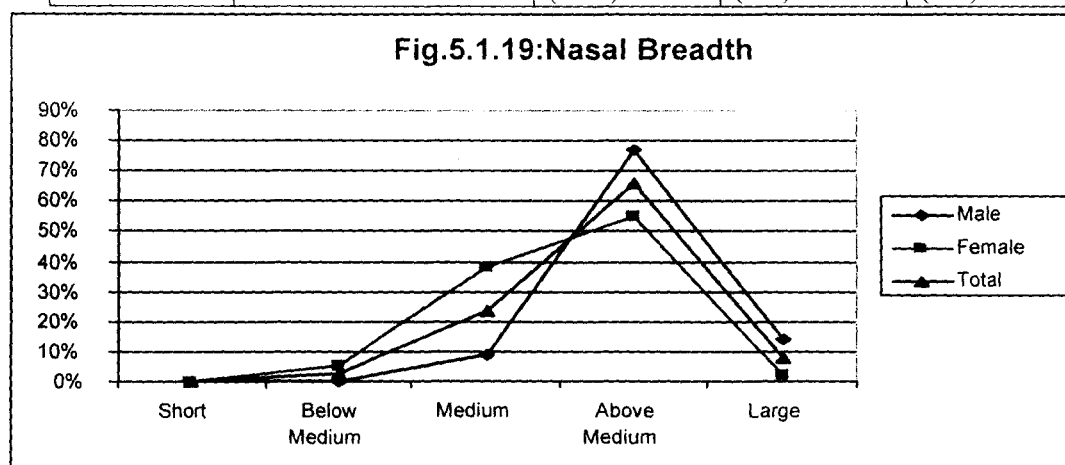
5.1.44: Nasal Depth:

The population mean of the measurement is 1.44 cm with 1.59 cm as mean for male and 1.30 cm as mean for female. The range of the character varies from 0.8 cm to 2.2 cm.

Table 5.1.44A: Statistical Constants of Nasal Depth

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	1.0 – 2.2	1.59 + 0.03	0.26 + 0.02	16.35 + 1.16
Female (N=100)	0.8 – 2.0	1.30 + 0.03	0.26 + 0.02	19.92 + 1.24
Total (N=200)	0.8 – 2.2	1.44 + 0.02	0.30 + 0.01	20.46 + 1.02

5.1.45: Nasal Length:

The mean nasal length of the population is 4.23 cm with a wider range having 3.1 cm as lower limit and 5.4 cm as upper limit. The corresponding figure of mean for male and female are 4.48 cm and 3.98 cm respectively.

Table 5.1.45A: Statistical Constants of Nasal Length

	Range in cm.	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	3.7- 6.4	4.48 + 0.05	0.49 + 0.03	10.84 + 0.77
Female (N=100)	3.1- 5.1	3.98 + 0.05	0.48 + 0.03	12.04 + 0.85
Total (N-200)	3.1- 5.4	4.23 + 0.04	0.54 + 0.03	12.77 + 0.64

5.1.46: Nasal Index:

In both sexes Nasal Index exhibit the same trend; Mesorhinae (45.5% for total, 52% for male and 39% female) followed by Chamaerhinae including its hyper group (for total 31.5% and 4.5%, for male 18% and 2%, for female 35% and 7% respectively). The mean value of the population is 80.61 (male 80.03 and female 81.19) with a wider range of 53.85 to 106.25.

Table 5.1.46A: Statistical Constants of Nasal Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	53.85 – 105.0	80.03 ÷ 0.98	9.76 + 0.69	12.19 + 0.86
Female (N=100)	60.0 – 106.25	81.19 + 1.29	12.86 + 0.91	15.84 + 1.12
Total (N=200)	53.85-106.25	80.61 + 0.81	11.40 + 0.57	14.14 + 0.71

Table 5.1.46B: Classification of Nasal Index

Class	Range	Male (%)	Female (%)	Total (%)
Hyperleptorhinae	Up to 54.9	1 (1%)	0 (0%)	1 (0.5%)
Leptorhinae	55.0- 69.9	17 (17%)	19 (19%)	36 (18%)
Mesorhinae	70.0- 84.9	52 (52%)	39 (39%)	91 (45.5%)
Chamaerhinae	85.0- 99.9	28 (28%)	35 (35%)	63 (31.5%)
Hyperchamaerhinae	100 and above	2 (2%)	7 (7%)	9 (4.5%)

Fig.5.1.20:Nasal Index
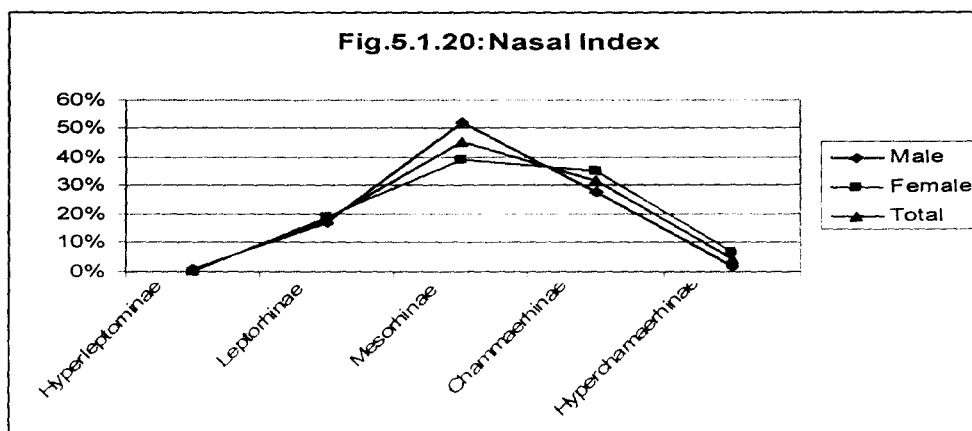
5.1.47: Nose Elevation Index:

The nose elevation index (40.33 for total) is greater sex biased having 42.37 as mean for male and 38.23 as mean for female. The range of female is much wider (having 21.05 as lower limit and 64.52 as upper limit) than their male counterpart (having 27.03 as lower and 56.41 as upper).

Table 5.1.47A: Statistical Constants of Nose Elevation Index

	Range	Mean ± S.E.	S.D.± S.E.	C.V. ± S.E.
Male (N=100)	27.03- 56.41	42.37 + 0.65	6.52 + 0.46	15.39 + 1.09
Female (N=100)	21.05- 64.52	38.23 + 0.91	9.09 + 0.64	23.75 + 1.68
Total (N=200)	21.05- 64.52	40.33 + 0.58	8.16 + 0.41	20.23 + 1.01

5.2: Somatoscopy:

Somatoscopic observations are also widely used parameters for racial classification, though some scholars have opinion against somatoscopy as a racial parameter because of lack of objectivity. However majority of the scholars have identified somatoscopy as major parameter for population differences, even many of them, according to some scholars, may have greater interpretative value than some of the metric characters. Again measures have been taken to incorporate greater objectivity to overcome the lacuna. The study have identified following observations (including 3 behavioural characters) after consulting similar type of studies of identifying population or population variation.

5.2.1: Skin Colour:

The Dhimals are, as per their skin colour, dark brown with a tendency towards light brown, specially in case of female. The table exhibit that majority of the population are dark brown (80%) with 20% Light Brown to Brown. Male are more dark brown (91%) compared to female (69%); a considerable portion of female (31%) are of lighter colour (Light Brown to Brown).

Table 5.2.1: Skin Colour (Forehead)

Skin Colour	Number		
	Male (%)	Female (%)	Total (%)
Light Brown to Brown	9 (9%)	31 (31%)	40 (20%)
Dark Brown	91 (91%)	69 (69%)	160 (80%)

5.2.2: Head Hair Colour:

For hair colour the Dhimal supposed to consider as black haired people. The entire males (100%) are with Black hair compared to 98% of their female counterpart. Only 2% of female are deviated from black, but of dark shade having brownish black hair. No other colour has been observed during the study. Overall 99% of the people have Black hair compared to a very few (1% only) people with Brownish Black hair.

Table 5.2.2: Head Hair Colour

	Number		
	Male (%)	Female (%)	Total (%)
Black	100 (100%)	98 (98%)	198 (99%)
Brownish Black	0 (0%)	2 (2%)	2 (1%)

5.2.3: Head Hair Form:

They are purely Leiotrichous, no other form of hair has been observed during the survey. Within the group they are most likely characterized by Straight Wavy hair (47%) followed by Long wave (31%). The male and female also exhibit the same trend having 45% Straight Wave for male and 49% for female, followed by 36% Long Wave for male and 26% for female. However, female exhibit a high Straight hair (25%) compared to male (19%).

Table 5.2.3: Head Hair Form

	Number		
	Male (%)	Female (%)	Total (%)
Straight	19 (19%)	25 (25%)	44 (22%)
Straight Wave	45 (45%)	49 (49%)	94 (47%)
Long Wave	36 (36%)	26 (26%)	62 (31%)

5.2.4: Head Hair Texture:

The hairs are of medium textured. Female are characterized by Medium (69%) followed by Coarse (24%); male are also characterized by Medium (77%) but followed by Fine (13%) and then Coarse (10%). Overall Medium (73%) followed by Coarse (17%) hair have been found in higher frequency among the Dhimal of this region.

Table 5.2.4: Head Hair Texture

	Number		
	Male (%)	Female (%)	Total (%)
Coarse	10 (10%)	24 (24%)	34 (17%)
Medium	77 (77%)	69 (69%)	146 (73%)
Fine	13 (13%)	7 (7%)	20 (10%)

5.2.5: Occipital Hair Whorl:

Single clockwise occipital hair whorl (+) predominates (73% for male, 78% for female and 75.5% as total) followed by Single anticlockwise (-) occipital hair whorl (20% for male, 22% for female and 21% for total). However, female are exclusively of single occipital hair whorled, but 7% of male are of doubled hair whorled, among them 2 persons having combination of two clockwise occipital hair whorl, 3 with two

anticlockwise occipital hair whorl and remaining 3 with mixed (clockwise and anticlockwise) but double occipital hair whorl.

Table 5.2.5: Occipital Hair Whorl

	Number		
	Male (%)	Female (%)	Total (%)
+	73 (73%)	78 (78%)	151 (75.5%)
-	20 (20%)	22 (22%)	42 (21%)
⌐ ⌐	2 (2%)	0 (0%)	2 (1%)
- -	3 (3%)	0 (0%)	3 (1.5%)
+ -	2 (2%)	0 (0%)	2 (1%)

5.2.6: Beard and Moustaches:

This is an exclusive character for male. Overall they are of scanty beard and moustache having 80% of male within it, followed by 15% having medium beard and moustaches development.

Table 5.2.6: Beard and Moustaches

	Number
	Total (Male only) (%)
Scanty	80 (80%)
Medium	15 (15%)
Thick	5 (5%)

5.2.7: Hypertrichosis of Ear:

Another trait exclusively found in male. The character is totally absent (100%) among male lines of the Dhimal population of this region.

Table 5.2.7: Hypertrichosis of Ear (Male only)

	Number
	Total (%)
Absent	100 (100%)
Present	0 (0%)

5.2.8: Eye Colour:

They are of dark eye colour having 81% in total, 87 % in female and 75% for male, followed by dark brown (16% for total, 13% for female and 19% for male). A very few of them (3%) are of light brown eyed.

Table 5.2.8: Eye Colour

	Number		
	Male (%)	Female (%)	Total (%)
Dark	75 (75%)	87 (87%)	162 (81%)
Dark Brown	19 (19%)	13 (13%)	32 (16%)
Light Brown	6 (6%)	0 (0%)	6 (3%)

5.2.9: Eye Fold:

Epicanthic eye fold is present to all male members (100%) of the community, however, 11% of female are without epicanthic eye fold. Overall 94.5% population have eye fold, among them the majority are of External Epicanthic Fold (74.5% for total, 84% for male and 65% for female) followed by Internal Eye fold (13.5% for total, 11% for male and 16% for female).

Table 5.2.9: Eye Fold

	Number		
	Male (%)	Female (%)	Total (%)
No Fold	0 (0%)	11 (11%)	11 (5.5%)
Internal Epicanthic Fold	11 (11%)	16 (16%)	27 (13.5%)
External Epicanthic Fold	84 (84%)	65 (65%)	149 (74.5%)
Median Epicanthic Fold	0 (0%)	8 (8%)	8 (4%)
Complete Epicanthic Fold	5 (5%)	0 (0%)	5 (2.5%)

5.2.10: Eye Opening- Height:

The height of the eye opening are Medium (57.5% for total, 62% for male and 53% for female), followed by Narrow (36.5% for total, 36% for male and 37% for female). A very few of them are Wide eyed (6% for total, 2% for male and 10% for female).

Table 5.2.10: Eye Opening: Height

	Number		
	Male (%)	Female (%)	Total (%)
Wide	2 (2%)	10 (10%)	12 (6%)
Medium	62 (62%)	53 (53%)	115 (57.5%)
Narrow	36 (36%)	37 (37%)	73 (36.5%)

5.2.11: Eye Obliquity:

Eye obliquity is almost absent (97.5% for total, 98% for male and 97% for female) among this community, a very few of them (2.5%) exhibit eye obliquity though with small degree.

Table 5.2.11: Eye Obliquity

	Number		
	Male (%)	Female (%)	Total (%)
Absent	98 (98%)	97 (97%)	195 (97.5%)
Present (Small)	2 (2%)	3 (3%)	5 (2.5%)

5.2.12: Nasion Depression:

Shallow Nasion depression has been found to occur with highest frequencies (77.5% for total, 67% for male and 88% for female) followed by Medium (19.5%, 29% and 10% respectively).

Table 5.2.12: Nasion Depression

	Number		
	Male (%)	Female (%)	Total (%)
Shallow	67 (67%)	88 (88%)	155 (77.5%)
Medium	29 (29%)	10 (10%)	39 (19.5%)
Deep	4 (4%)	2 (2%)	6 (3%)

5.2.13: Nasal Profile:

The nasal profile of male are more Straight (52%) followed by Concave (38%), but for female Concave predominate (58%) followed by Straight (39%). Overall the population exhibit Concave Nasal Profile (48%) followed by Straight (45.5%). The other two are of lesser frequencies (combined frequency 7%) compared to others.

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Table 5.2.13: Nasal Profile

	Number		
	Male (%)	Female (%)	Total (%)
Concave	38 (38%)	58 (58%)	96 (48%)
Concavo-Convex	7 (7%)	3 (3%)	10 (5%)
Straight	52 (52%)	39 (39%)	91 (45.5%)
Convex	3 (3%)	0 (0%)	3 (1.5%)

5.2.14: Nostril Shape:

In female, majority of them are of Oval Nostril (70%) followed by Triangular (25%). For male Oval also predominate (49%) but not so as female, however, it is also followed by Triangular (32%). On the other hand, 19% male have Round nostril compared to 5% of their female counterpart. Overall population are of Oval nostril (59.5%) followed by Triangular (28.5%).

Table 5.2.14: Nostril Shape

	Number		
	Male (%)	Female (%)	Total (%)
Oval	49 (49%)	70 (70%)	119 (59.5%)
Round	19 (19%)	5 (5%)	24 (12%)
Triangular	32 (32%)	25 (25%)	57 (28.5%)

5.2.15: Membranous Lip Size – Upper:

The upper lip is of Medium in thickness (55.5%) though Thin (26.5%) or thick (18%) may have found with moderate frequencies. However female are less thick (15%)

than male (21%). The corresponding figures of male and female as Medium are 54% and 57% respectively; and for thin it is 25% and 18% respectively.

Table 5.2.15: Membranous Lip Size: Upper

	Number		
	Male (%)	Female (%)	Total (%)
Thin	25 (25%)	28 (28%)	53 (26.5%)
Medium	54 (54%)	57 (57%)	111 (55.5%)
Thick	21 (21%)	15 (15%)	36 (18%)

5.2.16: Membranous Lip Size – Lower:

For lower lip Medium is more pronounced than upper, and found with same proportions for male and female (63%). However, little difference is there between two sexes in respect of thin (male19%, female 21%) and thick (male 18%, female 16%) upper lip size of the population.

Table 5.2.16: Membranous Lip Size: Lower

	Number		
	Male (%)	Female (%)	Total (%)
Thin	19 (19%)	21 (21%)	40 (20%)
Medium	63 (63%)	63 (63%)	126 (63%)
Thick	18 (18%)	16 (16%)	34 (17%)

5.2.17: Lip Eversion:

Lip eversion is almost absent (95.5% for total, 96% for male and 95% for female); however if it is present (4.5% for total, 4% for male and 5% for female) the degree of eversion is Slight.

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Table 5.2.17: Lip Eversion

| | Number | | |
	Male (%)	Female (%)	Total (%)
None	96 (96%)	95 (95%)	191 (95.5%)
Slight	4 (4%)	5 (5%)	9 (4.5%)

5.2.18: Alveolar Prognathism:

Slight Prognathism have been found among the population (14.5%), though male have been found with greater proportion (21%) than their female counterpart (8%) in respect of the trait. However it is obvious from the table that majority of the population irrespective of sex are without such Prognathism (85.5% total, 79% male and 92% female).

Table 5.2.18: Alveolar Prognathism

| | Number | | |
	Male (%)	Female (%)	Total (%)
None	79 (79%)	92 (92%)	171 (85.5%)
Slight	21 (21%)	8 (8%)	29 (14.5%)

5.3: Behavioural Traits:

5.3.1: Hand Clasping:

R type (58%) predominate over L type (42%) in respect of male; however for female the pattern is different, L type has been found with greater proportions (57%) than R type (43%). Overall (after combined the data of two sexes) the population exhibit more or less same frequencies of two types having 50.5% R type followed by 49.5% L type.

Table 5.3.1: Hand Clasping

	Number		
	Male (%)	Female (%)	Total (%)
L type	42 (42%)	57 (57%)	99 (49.5%)
R type	58 (58%)	43 (43%)	101 (50.5%)

5.3.2: Arm Folding:

In general, L type slightly predominant (52.5%) over R type (47.5%). The trend is also very much similar to both sexes, again the differences between two sexes is minimal having 52% male and 53% female for L type and 48% male and 47% female for R type

Table 5.3.2: Arm Folding

	Number		
	Male (%)	Female (%)	Total (%)
L type	52 (52%)	53 (53%)	105 (52.5%)
R type	48 (48%)	47 (47%)	95 (47.5%)

5.3.3: Handedness:

Right handedness (R type) has been found with greater frequencies (96.5%) compared to Left handedness or L type (3.5% only) of the population. For male and female the trend is similar having 98% and 95% population with R type respectively.

Table 5.3.3: Handedness

	Number		
	Male (%)	Female (%)	Total (%)
L type	2 (2%)	5 (5%)	7 (3.5%)
R type	98 (98%)	95 (95%)	193 (96.5%)

5.4: ABO and Rh (D) Blood Groups:

5.4.1: ABO Blood Group:

For analysis of ABO blood group, male and female data of the population has been pooled as the character is autosomal in nature and no sex bias is there. The population exhibit highest concentration of B blood group (51.98%) followed by O (21.78%) and A (15.35%). AB blood group has been found with less frequency (10.89%) compared to others. The corrected estimate of different allele frequencies (with $\pm$ SE) of the population exhibit a high frequency of O allele, symbolized as r' (0.4677) followed by B allele, symbolized as q' (0.3910). The frequency of A allele (or p') found to be less compared to others (0.1413).

Table 5.4.1A: Phenotype Distribution of ABO system

Sample Size	Phenotype							
	O		A		B		AB	
	No	%	No	%	No	%	No	%
202	44	21.78	31	15.35	105	51.98	22	10.89

Fig of Table 5.4.1A: Phenotypic Distribution of ABO system
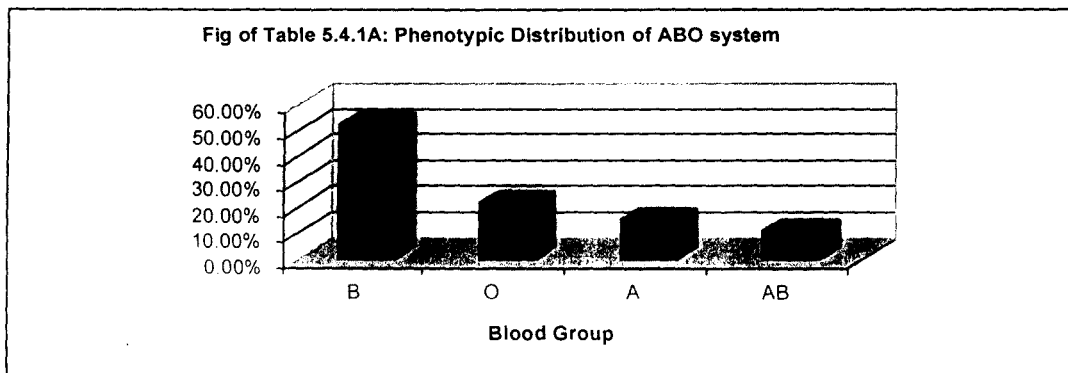
Table 5.4.1B: Allele frequencies of the ABO system

Sample Size	Allele Frequencies		
	p'	q'	r'
202	0.1413 ± 0.03	0.3910 ± 0.077	0.4677 ± 0.083

Fig. of Table 5.4.1B: Allele frequencies of the ABO system
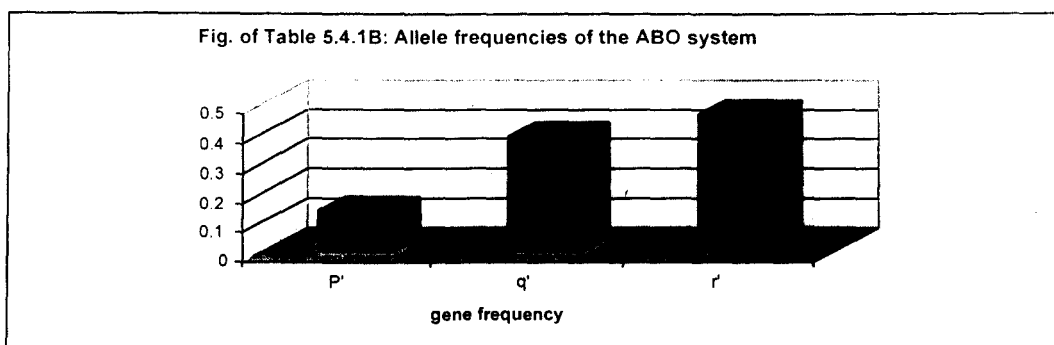
5.4.2: Rh (D) Blood Group:

For Rh (D) system the population exhibits a greater homogeneity than any other genetical traits. All the people irrespective of sex are Rh (D) positive (100%); no one is found to be Rh (D) negative. Hence the allele frequencies of 'D' is calculated as 1 compared to 0 for its 'd' counterpart.

Table 5.4.2A: Phenotype Distribution of Rh (D) system

Sample Size	Phenotype			
	Rh(D)+		Rh(D)-	
	No	%	No	%
202	202	100	0	0

Table 5.4.2B: Allele Frequencies of the Rh (D) system

Sample Size	Allele Frequencies	
	D	d
202	1	0

5.5: Colour Vision Test:

This is another character, like Rh (D) system which exhibit greater homogeneity having no single people of either sex with colour blindness irrespective of total colour blindness, Protan or Deutan type of colour blindness. Hence, the allele frequency for colour blindness of the population supposed to be 0 and allele for normal colour vision as 1.

Table 5.5.1A: Phenotype Distribution of Colour Blindness

	Number tested	Protan type	Deutan type	Percentage of colour blindness
Male	103	0	0	0
Female	103	0	0	0
Total	206	0	0	0

Table 5.5.1B: Allele Frequencies of the Colour Blindness

Sample Size	Allele Frequencies	
	C (Normal)	$C^{(+)}$ Colour Blindness
202	1	0

5.6: Taste Sensitivity to PTC:

Phenylthiocarbamide (PTC) taste sensitivity is a genetically inherited (follow Mendelian inheritance) character; the allele for the ability to taste PTC is dominant over the allele for non-taster. The test is being widely used for both genetic and anthropological interests as the frequency of taster and non-taster allele supposed to vary in different populations.

The taster percentage is somewhat higher in males (85.85%) than females (83.96%). Overall 84.91% are taster compared to 15.09% non tasters. Allele frequency of taster allele is again somewhat greater in males (0.6238) than their female counterpart (0.5995). The combined allele frequency is 0.6115. The threshold distribution of male, female as well as pooled data indicates a bimodal distribution and an antimode in between them. The antimode lies between solution number 4 and 5 for male and 3 to 4 for female. The mean threshold value is 8.839 ± 0.236. However for mean threshold value female hold greater value (8.955 ± 0.334) than their male counterpart (8.725 ± 0.335).

Table 5.6.1: PTC taste phenotype and allele frequency

	Sample Size	Phenotype		Allele frequency		
		Taster(%)	Non-taster(%)	T	t	± SE
Male	106	91 (85.85)	15 (14.15)	0.6238	0.3762	0.045
Female	106	89 (83.96)	17 (16.04)	0.5995	0.4005	0.044
Total	212	180(84.91)	32 (15.09)	0.6115	0.3885	0.032

Table 5.6.2: PTC taste threshold distribution

	Sample Size	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Male	106	15	3	4	3	3	2	5	6	8	8	9	30	6	4	0
Female	106	17	2	4	3	1	4	5	6	6	7	7	32	7	5	0
Total	212	32	5	8	6	4	6	10	12	14	15	16	42	13	9	0

Fig.5.6.1: PTC taste threshold distribution-Male
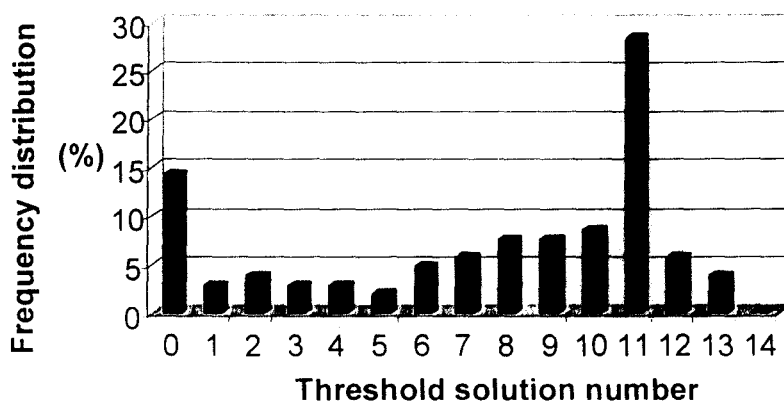
Fig.5.6.2: PTC taste threshold distribution-Female

Fig.5.6.3: PTC taste threshold distribution- Pooled data
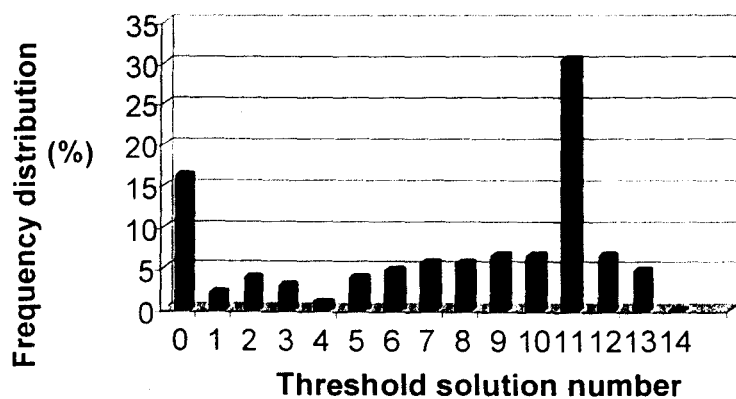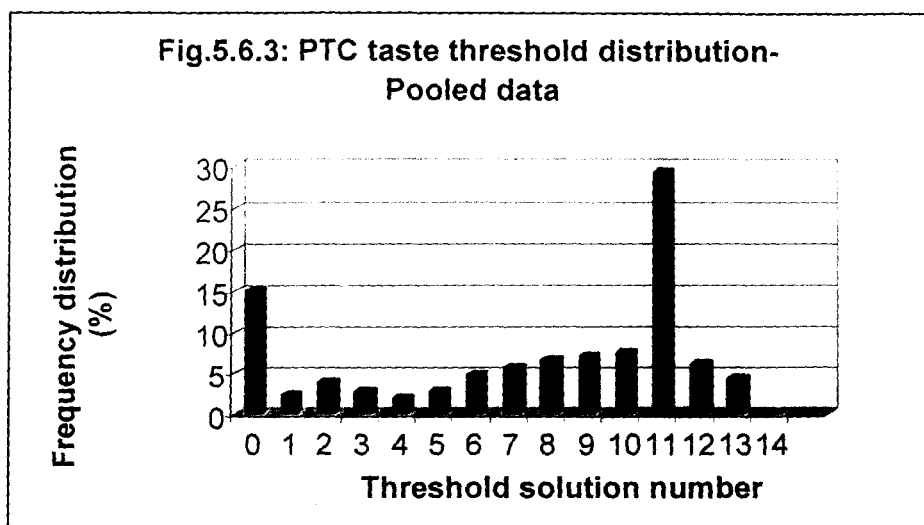
Table 5.6.3: Statistical constants of taste threshold for taster

	Sample size	Mean	± SE	S.D.	± SE	CV	± SE
Male	106	8.725	0.335	3.197	0.22	36.64	2.52
Female	106	8.955	0.334	3.151	0.22	35.19	2.42
Total	212	8.839	0.236	3.168	0.12	35.84	1.39

5.7: Dermatoglyphic Characters:

Dermatoglyphic features (on fingers, palms, toes and soles) due to its permanency, genetic influence as well as number of easily observable and measurable characters may be consider one of the most suitable parameter for population variability. For this study, only finger and palm prints were taken into consideration.

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5.7.1. Finger Pattern:

The finger prints of the population have been identified as Arch (Plain and Tented), Loop (Ulnar and Radial) and Whorl (True, Twin Loop Whorl, Lateral Pocket Loop Whorl and Central Pocket Loop Whorl). However the table (table 7.1) exhibits other seven except Lateral Pocket Loop Whorl because of non-availability of the said pattern among the population. Overall they are characterized by highest frequency of Whorls (52.65% for pooled data, 55.1% for male and 50.2% for female) followed by Loop (45.2%, 42.16% and 48.24% respectively) and Arch (2.16%, 2.75% and 1.57% respectively). Among different types of Whorl True Whorls are more frequent (30.2% in respect of total pooled data, 32.55% in respect of total male and 27.84% in respect of total female) than Central Pocket Loop (16.47%, 16.67% and 16.27% respectively) and Twin Loop Whorl (5.98%, 5.88% and 6.08% respectively). For Loop it is more or less unipolar having more concentration of Ulnar Loop (43.73% in respect of total pooled data, 41.37% in respect of total male and 46.08% in respect of total female) than Radial Loop (1.47%, 0.78% and 2.16% respectively). Arch may exhibit a clear-cut sex differences having no single Plain Arch in case of female, compared to 1.96% (of total) for their male counterpart. Overall, Tented Arch (1.18% in respect of total) slightly predominates over Plain Arch (0.98% in respect of total). The bimanual differences in respect of finger pattern do not show marked differences for male, female or pooled as a whole.

However, for Male Whorls found more frequent on the digit I (79.41% followed by Loop 17.65%), digit IV (72.55% followed by Loop 26.47%) and digit II (47.06% followed by Loop 45.1%). Loops are more frequent on digit III (62.75% followed by Whorl 35.29%) and digit V (58.82% followed by 41.17%). Arches found with smaller frequencies and limited with first four digit with highest on digit II having 4.9% in respect of total. However for Female Arches are limited to first three digits only with highest on digit I and II having 2.94% for each in respect of total. Another notable feature for female is completely absent of Plain Arch among fingerprints of any digits. For concentration of Whorl or Loop the picture again deviated from their male counterpart, having more concentration of Whorls on digit IV (73.53% followed by Loop 26.47%) and digit I (59.81% followed by Loop 37.25%). Loops are more

concentrated on digit V (62.75% followed by Whorl 37.25%), digit III (61.76% followed by Whorl 36.27%) and digit II (52.94% followed by 44.11%). Overall Loops are found more frequent in females (48.24%) compared to their male counterpart (42.16%).

For male the decreasing frequency order in case of Whorls in respect of digits may looks like I > IV > II > V > III, whereas for female it is IV > I > II > V >III. The decreasing order of Loops for male is III > V > II > IV >I, and for female it is V > III >II > I > IV.

Table 5.7.1A: Digit wise percentage frequency of Papillary Patterns: Pooled data

Digit	Side	Arch		Loop		Whorl		
		Plain	Tented	Ulnar	Radial	True	TL	CPL
I	R	0.98	0.98	24.51	1.96	40.2	19.61	11.76
	L	1.96	1.96	26.47	1.96	38.24	17.65	11.76
	R+L	1.47	1.47	25.49	1.96	39.22	18.63	11.76
II	R	2.94	1.96	46.08	1.96	33.33	2.94	10.78
	L	1.96	3.92	42.16	7.84	25.49	7.84	10.78
	R+L	2.45	2.94	44.12	4.9	29.41	5.39	10.78
III	R	0	0	66.67	0	23.53	0.98	8.82
	L	1.96	1.96	57.84	0	26.47	5.88	5.88
	R+L	0.98	0.98	62.25	0	25.0	3.43	7.35
IV	R	0	0	26.47	0	47.06	1.96	24.51
	L	0	0.98	25.49	0.98	47.06	1.96	23.53
	R+L	0	0.49	25.98	0.49	47.06	1.96	24.02
V	R	0	0	61.76	0	9.8	0.98	27.45
	L	0	0	59.8	0	10.78	0	29.41
	R+L	0	0	60.78	0	9.8	0.49	28.43
All digits	R	0.78	0.59	42.16	0.78	30.78	5.29	16.67
	L	1.18	1.76	42.35	2.16	29.61	6.67	16.27
	R+L	0.98	1.18	43.73	1.47	30.2	5.98	16.47
All digits, Galton type	R	1.37		45.88		52.75		
	L	2.94		44.51		52.55		
	R+L	2.16		45.2		52.65		

Fig 5.7.1A. Frequencies of pattern on individual digits (Both)
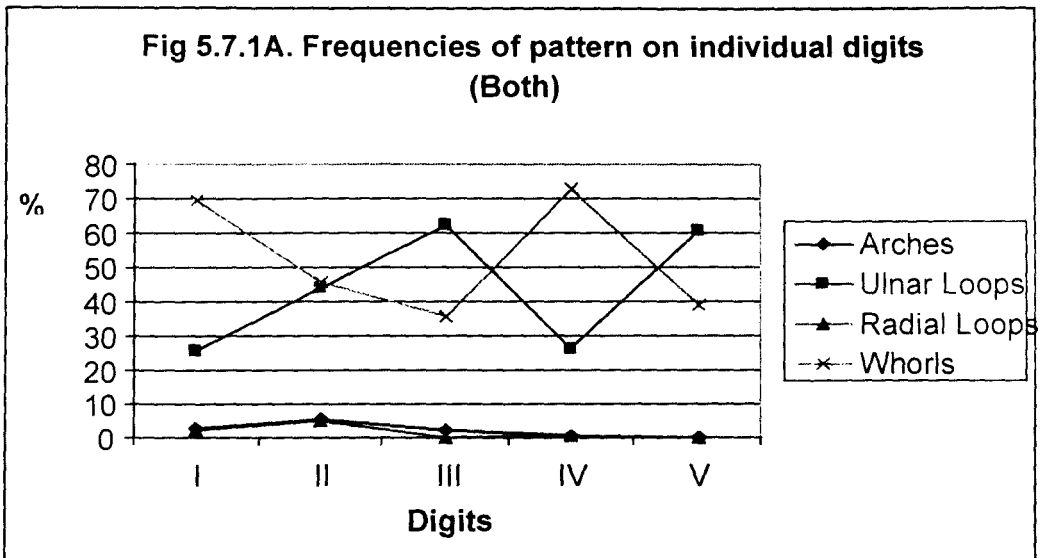
Table 5.7.1B: Digit wise percentage frequency of Papillary Patterns: Male

Digit	Side	Arch		Loop		Whorl		
		Plain	Tented	Ulnar	Radial	True	TL	CPL
I	R	1.96	0	15.69	0	50.98	19.61	11.76
	L	3.92	0	19.61	0	47.06	21.57	7.84
	R+L	2.94	0	17.65	0	49.02	20.59	9.8
II	R	5.88	1.96	43.14	1.96	33.33	0	13.73
	L	3.92	3.92	41.18	3.92	29.41	3.92	13.73
	R+L	4.9	2.94	42.16	2.94	31.37	1.96	13.73
III	R	0	0	66.67	0	19.61	1.96	11.76
	L	3.92	0	58.82	0	25.49	7.84	3.92
	R+L	1.96	0	62.75	0	22.55	4.9	7.84
IV	R	0	0	25.49	0	50.98	0	23.53
	L	0	1.96	25.49	1.96	45.1	1.96	23.53
	R+L	0	0.98	25.49	0.98	48.04	0.98	23.53
V	R	0	0	58.82	0	11.76	1.96	27.45
	L	0	0	58.82	0	11.76	0	29.41
	R+L	0	0	58.82	0	11.76	0.98	28.43
All digits	R	1.57	0.39	41.96	0.39	33.33	4.71	17.65
	L	2.35	1.18	40.78	1.18	31.76	7.06	15.69
	R+L	1.96	0.78	41.37	0.78	32.55	5.88	16.67
All digits. Galton type	R	1.96		42.65		55.69		
	L	3.53		41.96		54.51		
	R+L	2.75		42.16		55.1		

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Fig 5.7.1B. Frequencies of patterns on individual digits (Male)
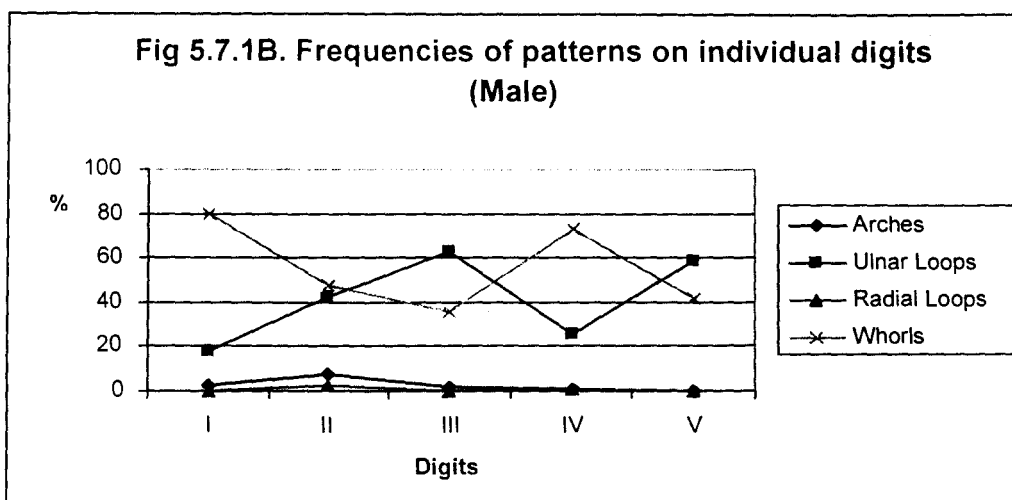
Table 5.7.1C: Digit wise percentage frequency of Papillary Patterns: Female

Digit	Side	Arch		Loop		Whorl		
		Plain	Tented	Ulnar	Radial	True	TL	CPL
I	R	0	1.96	33.33	3.92	29.41	19.61	11.76
	L	0	3.92	33.33	3.92	29.41	13.73	15.69
	R+L	0	2.94	33.33	3.92	29.41	16.67	13.73
II	R	0	1.96	49.02	1.96	33.33	5.88	7.84
	L	0	3.92	43.14	11.76	21.57	11.76	7.84
	R+L	0	2.94	46.08	6.86	27.45	8.82	7.84
III	R	0	0	66.67	0	27.45	0	5.88
	L	0	3.92	56.86	0	27.45	3.92	7.84
	R+L	0	1.96	61.76	0	27.45	1.96	6.86
IV	R	0	0	27.45	0	43.14	3.92	25.49
	L	0	0	25.49	0	49.02	1.96	23.53
	R+L	0	0	26.47	0	46.08	2.94	24.51
V	R	0	0	64.71	0	7.84	0	27.45
	L	0	0	60.78	0	9.8	0	29.41
	R+L	0	0	62.75	0	8.82	0	28.43
All digits	R	0	0.78	48.24	1.18	28.24	5.88	15.69
	L	0	2.35	43.92	3.14	27.45	6.27	16.86
	R+L	0	1.57	46.08	2.16	27.84	6.08	16.27
All digits, Galton type	R	0.78		49.41		49.8		
	L	2.35		47.06		50.59		
	R+L	1.57		48.24		50.2		

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Fig.5.7.1C Frequencies of pattern on individual digits (Female)
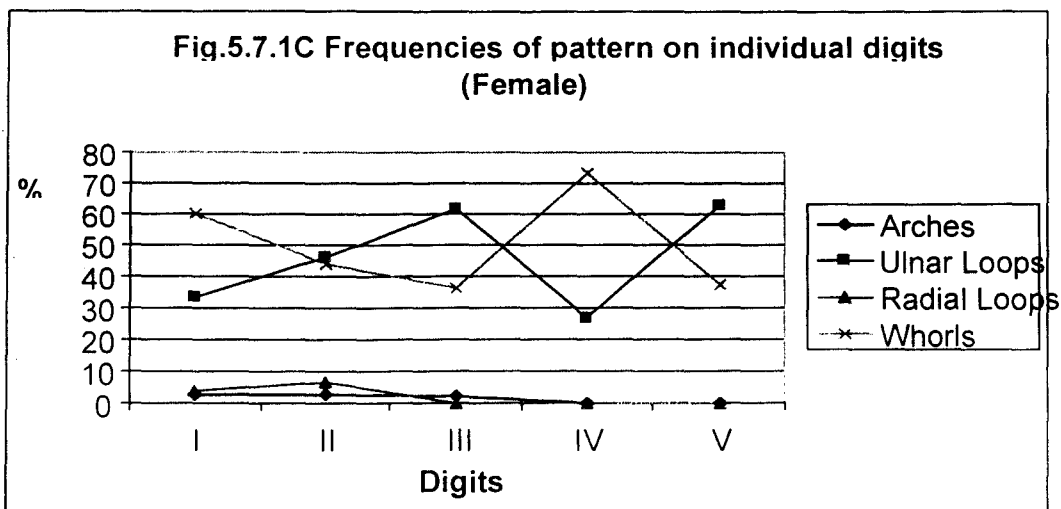
5.7.2. Indices:

The Pattern Intensity Index (PII) supposed to be one of the important parameter of population diversity. The Index value is somewhat higher (15.05 for pooled data, 15.24 for male and 14.86 for female) because of high proportion of Whorls as well as Loops compared to Arches. For Furuhata's Index (Polled 116.49) the sex difference is greater having 130.7 for male and 104.07 for female because of higher proportions of Whorls than Loops which found more frequently in male than female. The Dankmeijer's Index (Polled 4.1) again exhibit sex differences having more value for male (4.98) than their female counterpart (3.13); however, the cause is not related to frequency of Whorls but because of comparatively higher proportion of Arches for male than female. The Poll's Index (Polled value 4.78) is again shows greater sex differences (for male 6.51 and for female 3.25) resulted from comparatively high proportion of Arches as well as slightly lower proportion of Loops among male than their female counterpart.

Table 5.7.2: Percentage frequency of Indices

Pattern Type	Male	Female	Pooled data
Pattern Intensity Index	15.24	14.86	15.05 ·
Furuhata's Index	130.7	104.07	116.49
Dankmeijer's Index	4.98	3.13	4.1
Poll's Index	6.51	3.25	4.78

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5.7.3. Bimanuar:

The Bimanuar of pooled data as well as for male or female exhibit the same situation having more Whorls (in some extent concentration of Loops, may be examined by indirect way) with no or minimal Arches. The Bimanuar of male identified the modal point as 10W (17.65%), followed by 2W8L (15.69%), 6W4L (11.76%) and others. For female it is also 10W (13.73%) but followed by 7W3L (11.76%) and 6W4L (11.76%). When the data of both male and female are pooled together, it exhibit its peak at 10W (15.69%) followed by two equal peak 6W4L (11.76%) and 2W8L (11.76%).

Figure 5.7.3A: Bimanuar of Dhimal: Pooled data

WHORLS	0	1	2	3	4	5	6	7	8	9	10
10	15.69										
9	3.92										
8	6.86										
7	8.82	0.98									
6	11.76										
5	8.82		0.98								
4	7.84	0.98	0.98								
3	4.9		1.96								
2	11.76	0.98	0.98								
1	2.94					0.98					
0	5.88	0.98	0.98								

ARCHES

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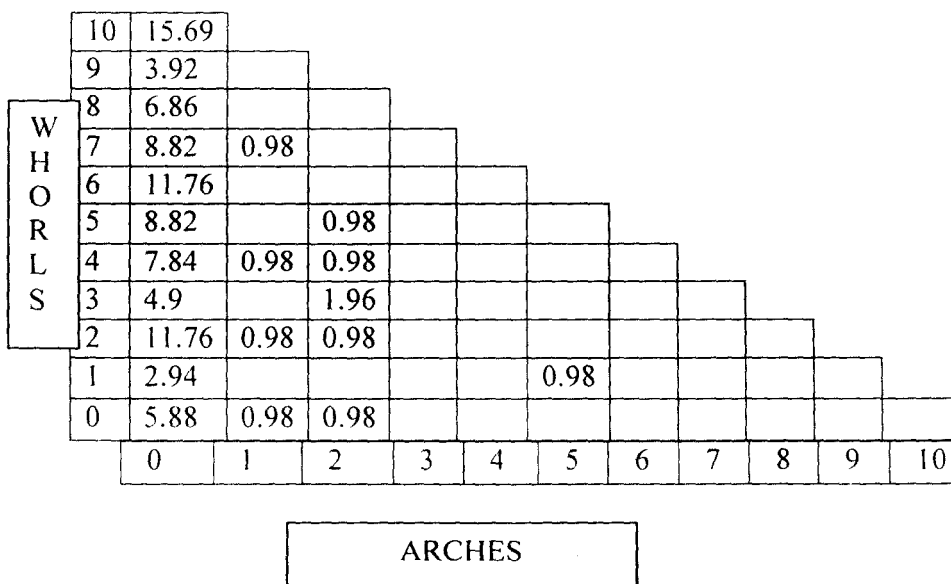
Figure 5.7.3B: Bimanuar of Dhimal: Male

WHORLS \ ARCHES	0	1	2	3	4	5	6	7	8	9	10
10	17.65										
9	5.88										
8	9.8										
7	5.88										
6	11.76										
5	7.84										
4	7.84	1.96									
3	1.96		3.92								
2	15.69										
1	1.96					1.96					
0	1.96	1.96	1.96								

ARCHES

Figure 5.7.3C: Bimanuar of Dhimal: Female

WHORLS \ ARCHES	0	1	2	3	4	5	6	7	8	9	10
10	13.73										
9	1.96										
8	3.92										
7	11.76	1.96									
6	11.76										
5	9.8		1.96								
4	7.84		1.96								
3	7.84										
2	7.84	1.96	1.96								
1	3.92										
0	9.8										

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5.7.4. Monomorphic Hands:

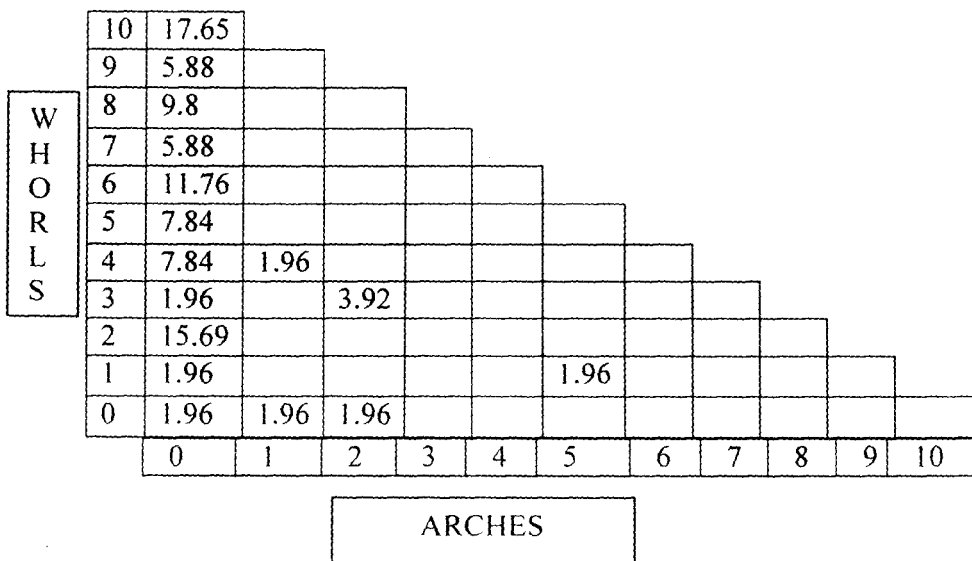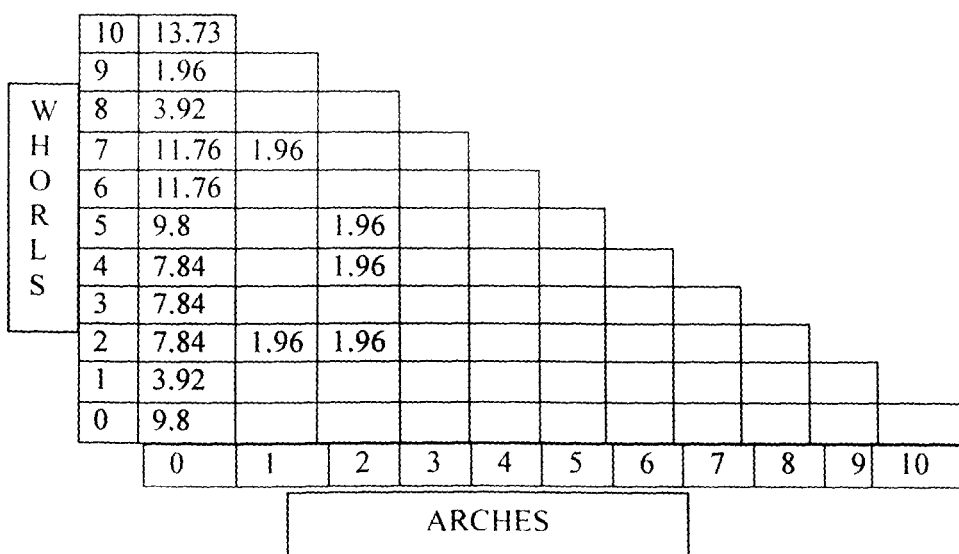Overall 30.39% of Dhimal are of monomorphic hand having 20.59% with Whorl and 9.8% with Loop, but no one of either sex are found with Arch. Majority of them are Monomorphic for both hands (21.57% in respect of total) followed by Right hand only (4.9% in respect of total) and Left hand only (3.92%). For male the proportions of Monomorphic are 31.73% with 19.61% both hand followed by equal proportions of Right hand only and Left hand only (5.88% for each). In comparison, female are less Monomorphic (29.41%), but proportions of both hand Monomorphic are higher (23.53%) compared to male, followed by Right hand only (3.92%) and Left hand only (1.96%).

Table 5.7.4: Percentage frequency of Monomorphic Hands

	Type	Right Hand only	Left Hand only	Both Hand	Total
Male	Whorl	5.88	3.92	17.65	27.45
	Loop	0	1.96	1.96	3.92
	Total	5.88	5.88	19.61	31.37
Female	Whorl	0	0	13.73	13.73
	Loop	3.92	1.96	9.8	15.69
	Total	3.92	1.96	23.53	29.41
Pooled Data	Whorl	2.94	1.96	15.69	20.59
	Loop	1.96	1.96	5.88	9.8
	Total	4.9	3.92	21.57	30.39

5.7.5. Symmetrical Patterns on all Homologous Fingers:

About half of the population exhibit symmetrical pattern on all homologous fingers (49.02%) with a marked sex differences having more than half (52.94%) of the male with symmetrical pattern on all homologous finger compared to 45.1% for their female counterpart.

Table 5.7.5: Frequency of Individuals with Symmetry-Asymmetrical pattern

	Number studied	Symmetry (%)	Asymmetry (%)
Male	102	52.94	47.06
Female	102	45.1	54.9
Polled data	204	49.02	50.98

5.7.6. Mean Ridge Count of Fingers:

Digit I of both hand and of both sex exhibit higher mean ridge count (19.24 for pooled data, 20.54 for male and 17.93 for female) followed by digit IV (pooled 17.86, male 17.99 and female 17.73), digit III (pooled 14.92, male 15.7 and female 14.15), digit V (14.85 for pooled, 15.66 for male and 14.05 for female) and lastly digit II (14.22 for pooled, 14.43 for male and 14.01 for female). Bilateral variations in respect of ridge count are minimal having highest on digit I (18.79 for Left and 19.68 for Right) and lowest on digit II (14.13 for Left and 14.31 for Right).

Table 5.7.6: Mean Ridge Count of Fingers

	Hand	I	II	III	IV	V
Male	Left	20.45	14.47	16.02	18.35	15.9
	Right	20.63	14.39	15.37	17.63	15.41
	Total	20.54	14.43	15.7	17.99	15.66
Female	Left	17.14	13.78	13.57	17.84	14.16
	Right	18.73	14.24	14.73	17.61	13.94
	Total	17.93	14.01	14.15	17.73	14.05
Pooled data	Left	18.79	14.13	14.79	18.1	15.03
	Right	19.68	14.31	15.05	17.62	14.68
	Total	19.24	14.22	14.92	17.86	14.85

5.7.7: Total Finger Ridge Counts:

The mean total finger ridge count of the population is 162.18 + 3.38 with a wide range of 16 to 267. Male exhibit greater TFRC (168.63 ± 5.03) with much wider range (16 to 267) in comparison with their female counterpart having 155.73 ± 4.45 as mean (± SE) and 59 to 257 as range.

Table 5.7.7: Total Finger Ridge Count and their Statistical Constants

	Range	Mean	± S.E.	S.D.	± S.E.	C.V.	± S.E.
Male	16-267	168.63	5.03	50.78	3.56	30.11	2.11
Female	59-257	155.73	4.45	44.91	3.14	28.84	2.02
Total	16-267	162.18	3.38	48.25	2.39	29.75	1.47

5.7.8. Palmer Pattern Areas:

Both male female as well as pooled data as a whole exhibit high proportion of pattern on IV interdigital areas (88.73% for pooled, 88.24% for male and 89.22% for female), followed by III interdigital areas (27.45% for polled, 27.45% for male and 24.51% for female) and Hypothenar areas (21.57% for pooled, 10.78% for male and 32.35% for female). In II interdigital areas the patterns occur with lowest frequencies (1.96% for each category). Overall sex differences are found in respect of Hypothenar (male 10.78%, female 32.35%) and Thenar-I interdigital areas (male 13.73%, female 4.9%). In some cases marked bilateral differences may seen in greater extent (in male: Thenar-I interdigital 7.84% for Right and 19.6% for left, III interdigital 33.33% for Right and 21.57% for Left, in female: III interdigital 27.45% for Right and 21.57% for Left).

Table 5.7.8: Percentage frequency of palmer pattern areas

	Hand	Palmer areas				
		Hypothenar	Thenar & I interdigital	II interdigital	III interdigital	IV interdigital
Male	Right	11.76	7.84	1.96	33.33	86.27
	Left	9.8	19.6	1.96	21.57	90.2
	R+L	10.78	13.73	1.96	27.45	88.24
Female	Right	33.33	3.92	1.96	27.45	90.2
	Left	31.37	5.88	1.96	21.57	88.24
	R+L	32.35	4.9	1.96	24.51	89.22
Pooled	Right	22.55	5.88	1.96	30.39	88.24
	Left	20.59	12.75	1.96	24.51	89.22
	R+L	21.57	9.31	1.96	27.45	88.73

5.7.9. Main Line Formula:

The 7.5.5- is predominant (52.94% for pooled, 49.02% for male and 56.86% for female) followed by 9.7.5- (21.57%, 30.39% and 20.59% respectively) and 11.9.7- (11.76%, 15.69% and 11.76% respectively). Other formulae (11.0.7-, 9.0.5-, 9.X.5-, 7.9.5- and 7.0.5-) found with lesser or zero (11.X.7-) percentile. Sex differences are greater having as many as 9.8 point differences for both 9.7.5- and 7.5.5- formulae of the population. Bilateral differences are also greater; for 9.7.5- formulae of male it is 35.29% for right and 25.49% for left, and for same formulae of female it is 23.53% and 17.65% respectively.

Table 5.7.9: Percentile Frequency of Main Line Formulae

	Hand	A			b			c		
		11.9.7	11.X.7	11.0.7	9.7.5	9.X.5	9.0.5	7.5.5	7.9.5	7.0.5
Male	Right	13.73	0	0	35.29	1.96	0	47.06	1.96	0
	Left	17.65	0	0	25.49	0	0	50.98	3.92	1.96
	R+L	15.69	0	0	30.39	0.98	0	49.02	2.94	0.98
Female	Right	9.8	0	5.88	23.53	0	1.96	54.9	1.96	1.96
	Left	13.73	0	3.92	17.65	0	5.88	58.82	0	0
	R+L	11.76	0	4.9	20.59	0	3.92	56.86	0.98	0.98
Pooled	Right	11.76	0	2.94	29.41	0.98	0.98	50.98	1.96	0.98
	Left	15.69	0	1.96	21.57	0	2.94	54.9	1.96	0.98
	R+L	13.73	0	2.45	25.49	0.49	1.96	52.94	1.96	0.98

5.7.10. Main Line D Termination:

Main line D terminate more frequently at region 7 (55.88%) followed by region 9 (27.94%) and region 11 (16.18). However for right hand the first one (termination at position 7) is 53.92 % followed by second (termination at position 9: 31.37%) compared to 57.84% and 24.51% for Left hand. A marked sex differences may identified in respect of termination of Main Line D; for male termination at position 7 is identified among 52.94% population followed by 31.37% population having termination at position 9 compared to 58.82% and 24.51% respectively among their female counterpart.

Table 5.7.10: Percentage frequency of Main Line D termination

	Hand	11	9	7
Male	Right	13.73	37.25	48.96
	Left	17.65	25.49	56.86
	Total	15.69	31.37	52.94
Female	Right	15.68	25.49	58.52
	Left	17.65	23.53	58.82
	Total	16.66	24.51	58.82
Pooled data	Right	14.7	31.37	53.92
	Left	17.65	24.51	57.84
	Total	16.18	27.94	55.88

5.7.11. Main Line C Termination:

Irrespective of sex as well as on both hands, the Main Line C terminates more frequently at Ulnar side (78.43% for pooled, 8.39% for Right and 76.47% for Left) followed by Radial side (15.69% for pooled, 13.72% for Right and 17.65% for Left). A very few (5.88%) terminated proximally or absent at all. For male it terminates more at Ulnar (79.41%) than female (77.45%) followed by radial (18.63% and 12.74% respectively). However, among female it terminates more at proximal side or absent (9.8%) than male (1.96%).

Table 5.7.11: Percentage frequency of Main Line C termination

	Hand	Ulnar	Radial	Proximal and Absent
Male	Right	82.35	15.69	1.96
	Left	76.47	21.57	1.96
	Total	79.41	18.63	1.96
Female	Right	78.43	11.76	9.8
	Left	76.47	13.73	9.8
	Total	77.45	12.74	9.8
Pooled data	Right	80.39	13.72	5.88
	Left	76.47	17.65	5.88
	Total	78.43	15.69	5.88

5.7.12. Main Line Index:

The male female differences or bilateral differences of the population in respect of Main line index exhibit greater similarities than other traits. Overall MLI of the population is 7.38 ± 0.1; for male it is 7.46 ± 0.15 and for female 7.29 ± 0.14. However a slight deviation may seen in respect of bilateral differences; for male values of Right and Left are 7.75 ± 0.2 and 7.18 ± 0.21, whereas for female it is 7.47 ± 0.2 and 7.12 ± 0.2 respectively. Whatever is the situation, both male and female as well as both Right and Left hand exhibit the same trend in respect of range, having 5 as lower and 11 as upper limit.

Table 5.7.12: Main Line Index and their statistical constants

		Range	Mean	± S.E.	S.D.	± S.E.	C.V.	± S.E.
Male	Right	5-11	7.75	0.2	2.03	0.14	26.19	1.83
	Left	5-11	7.18	0.21	2.08	0.15	28.97	2.03
	R+L	5-11	7.46	0.15	2.07	0.1	27.75	1.37
Female	Right	5-11	7.47	0.2	2.01	0.14	26.91	1.88
	Left	5-11	7.12	0.2	2.01	0.14	28.23	1.98
	R+L	5-11	7.29	0.14	2.01	0.1	27.57	1.36
Pooled	Right	5-11	7.61	0.14	2.02	0.1	26.54	1.31
	Left	5-11	7.15	0.14	2.04	0.1	28.53	1.41
	R+L	5-11	7.38	0.1	2.04	0.07	27.64	0.97

5.7.13. Position of Axial Triradii:

In all samples, whether it is male or female, right or left, the majority of the palms are characterized by highest frequency of single triradius t, at the base of the palm (67.17% for pooled, 77.45% for male and 56.86% for female) followed by t' (20.59%, 17.65% and 23.53% respectively). Like male and female, right and left hands exhibit the differences in respect of percentage of t on palms (for male Right and Left values are 74.51% and 80.39% respectively, for female it is 54.9% and 58.82% respectively).

Table 5.7.13: Percentage frequency of axial triradii t

	Hand	t	t'	t"	tt'	tt"
Male	Right	74.51	19.61	1.96	0	3.92
	Left	80.39	15.69	1.96	0	1.96
	R+L	77.45	17.65	1.96	0	2.94
Female	Right	54.9	23.53	0	13.73	7.84
	Left	58.82	23.53	1.96	3.92	11.76
	R+L	56.86	23.53	0.98	8.82	9.8
Pooled	Right	64.71	21.57	0.98	6.86	5.88
	Left	69.61	19.61	1.96	1.96	6.86
	R+L	67.16	20.59	1.47	4.41	6.37

5.7.14. *atd* Angle:

However, if *atd* angle used to consider as a parameter, the sex or bilateral differences are minimal. The *atd* angle for pooled data is 42.29^0 with 42.24^0 for male and 42.34^0 for female. Bilateral differences for female is again minimal (right 42.61^0, left 42.08^0) compared to male (right 43.04^0, left 41.43^0). The range of the *atd* angle (32^0-60^0 for pooled, 32^0-56^0 for male and 33^0-60^0 for female) again do not show significant differences within such segments of the population.

Table 5.7.14: atd angle

		Range	Mean	± S.E.	S.D.	± S.E.	C.V.	± S.E.
Male	Right	33^0-56^0	43.04^0	0.48^0	4.82^0	0.34	11.2	0.78
	Left	32^0-55^0	41.43^0	0.45^0	4.57^0	0.32	11.03	0.77
	R+L	32^0-56^0	42.24^0	0.33^0	4.76^0	0.24	11.27	0.56
Female	Right	35^0-58^0	42.61^0	0.46^0	4.62^0	0.32	10.84	0.76
	Left	33^0-60^0	42.08^0	0.47^0	4.79^0	0.34	11.38	0.8
	R+L	33^0-60^0	42.34^0	0.33^0	4.71^0	0.23	11.12	0.55
Pooled	Right	33^0-58^0	42.82^0	0.33^0	4.72^0	0.23	11.02	0.55
	Left	32^0-60^0	41.75^0	0.33^0	4.68^0	0.23	11.21	0.55
	R+L	32^0-60^0	42.29^0	0.23^0	4.73^0	0.17	11.18	0.39

5.8. Findings:

From above discussion it revealed that Dhimals are of medium stature with a tendency toward short; with a sex bias having more male as short compared to more female within below medium group. However, on an average, male are somewhat taller than female. Regarding Cormic index majority of them are metriocormic; however, it is more sex biased than stature, with male having a tendency towards macrocormic and females towards brachyormic. It indicates that relative length of the upper limb compared to lower limb is comparatively larger than their male counterpart. As far as arm length is concern, irrespective of sex, they are of short arm people. The leg length is again a sex biased one: almost all male exhibit long legged character, whereas for female both extremes are common with more concentrations as short legged. Again as per bi-acromial breadth they are of narrow shouldered compared to height. In respect of pelvis, male are medium pelvic people with a tendency towards narrow, whereas for female majority of them are of broad pelvic. The weight of two sexes varies greatly; however, as per Body Mass Index majority of them are within normal range, though female exhibit mild thinness much compared to their male counterpart. For length-breadth Index of hand it is difficult to classify Dhimals, as it ranges widely from dolichocheir to brachycheir for both sexes of the population. For foot index they are brachypod with a tendency towards mesopod, however, for females both appear in more or less same frequencies compare to their male counterpart.

As per Head length, they are of medium group with a tendency towards long head length. On the other hand, head breadth is again of medium group but with a tendency towards narrow head breadth. Both of which contributed a range of mesocephalic to brachycephalic head with little sex bias; however female are more mesocephalic than male. Morphological facial height is very low; though as per morphological facial index or morphological upper facial index they are distributed over all categories, hence no clear classification may exhibit. The Jugo-mandibular index is another one which exhibits no clear classification and varies from narrow to broad, whereas regarding Jugo-frontal index they are of very broad category followed by broad. Regarding nasal height male are mostly of below medium group whereas females are of short categories. On the other hand as per nasal breadth a very few are below

medium, no one is within short categories; male are of above medium group, female are also above medium but followed by medium group. Therefore, the nasal index of the population is overall mesorhinae followed by chamaerhinae.

Dhimals are of, as per somatoscopic observation, dark brown skin colour; however percentage of male in dark group is more than female. Almost all the Dhimal (except few female) are of black haired people with medium hair texture. Regarding hair form male are of straight wave followed by long wave, female are also possess straight wave but followed by both straight wave and straight hair. As per occipital hair whorl almost all of them (except very few male) possess single whorl and majority of them are of clockwise in nature. In male beard and moustaches are of scanty one, and hypertrichosis of ear is totally absent. Eye colour is dark one with typical epicanthic eye fold among all of them except few female. Eye opening is also medium to narrow with no obliquity. Nasion depression is mainly shallow with more straight nasal profile followed by concave for male and more concave followed by straight for female. Nostril shape is mostly oval followed by triangular shape. Membranous lip size in both cases (upper and lower lip) is medium in nature with no lip eversion in most cases. Alveolar prognathism is almost absent with few exceptions having slight alveolar prognathism.

Regarding hand clasping and arm folding people with both R and L type may found equally with small differences. However regarding handedness almost all of them are of R type, i.e. right handed people.

Regarding ABO blood group, highest concentration is of B blood group (more than half of the population) followed by O blood group (about 22%). Therefore, allele frequency suggests more O allele i.e. r' (0.47) followed by B allele i.e. q' (0.39). However in respect of Rh (D) blood group, no one from sample population found to be Rh (D) negative, hence the frequency of Rh (d) allele is zero.

Like previous, no one of the sample population found to be colour blind, hence, frequency of colour blind allele of the population is zero.

In respect of PTC taste ability, about 85% of the sample population tested as taster. The allele frequency of taster is calculated as 0.61 with little sex differences. The mean threshold of the population is 8.84 with a greater mode at 11 and anti mode at 4.

The finger type of sample population exhibits more whorls (52.65%) followed by loops (45.25) with little sex differences. Arches are very few in both sexes (2.16).

Ulnar loops are more frequent (43.73) than radial loops (1.47). Digit I and IV are characterized by greater number of arches, digit III and V for loops (specially ulnar loops) and digit II as equal frequencies of both. Arches are absent in digit V and almost absent in digit IV and III. The values of different indices are as follows: Pattern Intensity Index 15.05, Furuhata's Index 116.49, Dankmeijer's Index 4.1 and Poll's Index 4.78. The bimanuar of studied population exhibit its mode at 10W (15.69%) followed by two equal peak 6W4L (11.76%) and 2W8L (11.76%). Overall 30.39% of the population has monomorphic hand with 21.57% as both hands and 4.9% and 3.92% as right and left hand respectively. Whorls are more frequent (20.59%) than loop (9.8%) in case of monomorphic hand, but no single case of arch monomorphic hand recorded during the study. Nearly half of the population (49.02%) exhibits symmetrical pattern on all homologous fingers, however, male exhibits more than their female counterpart. Mean Finger Ridge Count is highest on digit I (19.24) followed by digit IV (17.86) and so on with a Total Finger Ridge Count of 162.18.

The IV interdigital area is characterized by more pattern (88.73%) followed by III interdigital (27.45%) and hypothenar area (21.57%). Main line formula 7.5.5 is more frequent with more than half of the population (52.94%) within it, followed by 9.7.5 (25.49%) and 11.9.7 (13.73%). Main line D terminates more frequently (55.88%) on region 7 and Main line C terminates more on ulnar side (78.43%) than others. The Main Line Index calculates as 7.38 with little sex differences among them. They are characterized by single axial triradius (89.22%) and located at the base of the palm or position t (67.16%) followed by t' (20.59%). The range of the atd angle varies from 32^0-60^0 with a mean value of 42.29^0.