

## Original Research Article

# Scientific and Physical Anthropological Study of Kalinga Caste Population of Eastern Andhra Pradesh State in India

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## ABSTRACT

### Keywords

Anthropometric indices, Kalingas

The present paper attempts to evaluate Anthropological traits in Kalinga, an endogamous caste population from the North Coastal Andhra Pradesh. So far, several anthropogenetic studies have been carried out on several tribal and non-tribal communities however, the present study population “Kalinga” has not been touched so far hence, the observations made in this paper will add to the existing information on caste population of Andhra Pradesh. The main objectives include anthropometric profile in the Kalinga caste on the basis of some somatometric indices. The observations (Anthropological indices) were compared with data available on other caste population of the state.

## Introduction

The present Chapter presents an anthropometric profile of the Kalinga Caste Population of Andhra Pradesh. It includes 12 anthropometric indices among the Kalingas and the results are compared with those observed in other caste populations from Andhra Pradesh.

## Materials and Methods

A sample of 214 male and 225 female adult individuals belonging to Kalinga caste from Srikakulam district of Andhra Pradesh forms the basis for this anthropometric study. Procedures of taking twelve body indices were covered in the present study.

## Statistical methods

The statistical formulae for computing mean, standard deviation, standard errors, t – value etc. were presented and elaborated in the preceding Chapter.

## Result and Discussion

### Anthropometric Indices

The details of anthropometric indices.

The mean values with their standard errors for different anthropometric indices computed for males as well as females of Kalinga caste group are presented in Table –

1. The distribution of individual values for the 12 indices are discussed here.

t – test is applied in order to understand the significance of the differences in mean index values observed in the two sexes. The results are shown in Table – 2. Significant differences between the two sexes are observed in the case of relative biacromial breadth index, physiconomic facial index, Jugo – mandibular index, nasal index, pignet – vervaek index, robusticity index and ponderal index.

The mean index values are in general, high among males than among females with the exception of ponderal index, nasal index, chervin's cephalic facial index and the upper facial index and some of the differences even attained statistical significance as shown in the table 2.

t – test is applied in order to understand the significance of the differences in mean index values observed in the two sexes. The results are shown in Table – 3. Significant differences between the two sexes are observed in the case of relative biacromial breadth index, physiconomic facial index, Jugo – mandibular index, nasal index, pignet – vervaek index, robusticity index and ponderal index.

The mean index values are in general, high among males than among females with the exception of ponderal index, nasal index, chervin's cephalic facial index and the upper facial index and some of the differences even attained statistical significance as shown in the table 3(Fig. 1).

### **Comparison of anthropometric traits with other caste populations of Andhra pradesh**

This data is mainly available in the form of

unpublished reports in the departments of Anthropology and Human Genetics in Andhra University and the same has been used for the present comparison (Table – 3).

An attempt is also made here to compare the mean values of three body indices of Kalingas with those reported among other Andhra Caste populations (Table – 4).

It can be noticed that the mean value for cephalic index among males shows not much variations and the values ranged from 74.40 (Vadabalijas) to 79.28 (Kalingas) while in females it ranged from 72.69 (Kapus) to 78.93 (Kalingas). The nasal index values ranged from 70.34 (Vadabalijas-II) to 85.76 (Vadabalijas-I) among men and from 51.20 (Kapus) to 76.25 (Kalingas) among women. Mean values for cephalo facial index ranged from 82.50 (Rajakas) to 97.13 (Kalingas) among men and from 72.12 (Kapus) to 98.40 (Kalingas) among women. These values are also found to be well within the range found among caste populations of Andhra Pradesh.

## **Conclusion**

### **Anthropometry**

Since persons living under different conditions and members of different ethnic groups and their offspring of unions between them frequently presenting differences in bodily form and proportions, it is desirable to have some means of giving quantitative expression to the variations which are exhibited by such traits through anthropometry.

In the present study, the material for the anthropometric study comprises of 214 male and 225 female adult individuals belonging to Kalinga caste group.

As mentioned earlier, 12 somatometric

indices were computed to describe the body form of the Kalingas of the present study. The Relative Sitting Height Index values reveal that 40 percent of the males and 70 percent of the females are under 'Makroskel' category.

The average index value among males is 51.5 and it is 51.4 among females indicating no difference between the two sexes. The individual values ranged from 42.8 to 69.2 among males and from 38.5 to 63.3 among females. Regarding the Relative Biacromial Breadth Index, the mean value is 22.7 among males and 21.8 among females indicating very small difference between the two sexes.

The range of individual index value is 14.5 to 31.9 in men and 18.2 to 29.8 in women. The values of Relative Chest Girth Index indicates that about half of the males (50 percent) and more than half of the females (56 percent) come under the category of 'narrow chest'.

The mean index value is 51.2 in males with values ranging from 36.4 to 77.2 and the mean value in females is 50.6 with values ranging from 43.4 to 68.0. The average index value is slightly higher in males than in females.

With regard to the Cephalic Index, the distribution of values shows that most of the men (41 percent) and women (39 percent) are in 'mesocephalic' category. The mean index value among males (79.3) does not differ much from the mean value among females (78.9). The range of individual values is 54.9 to 131.2 in males and it is 61.3 to 115.6 in females.

Regarding the Physiognomic Facial Index, the mean index value among men (129.1) is higher than the mean index value of the

women (125.9). Range of individual values is between 107.6 and 158.8 in case of males and between 77.6 and 148.6 in case of females. In the same way, the mean index value for Upper Facial Index is found to be slightly more among females (61.9) than among the males (61.6). The range of individual values is between 42.1 and 101.2 in the case of males and between 53.1 and 105.2 in the case of females.

The distribution of Jugo-Mandibular Index values indicate that most of the males (43 percent) and females (39 percent) are found in 'medium' category while 23 percent of males and 34 percent of females fall in 'narrow' category. The average index value is higher in case of males (76.0) compared to that of females (74.0).

Range of individual values is between 58.3 and 96.1 in males and between 59.5 and 118.4 in females. The average value for Chervin's Cephalo - Facial Index is higher among the females (98.4) than among the males (97.1). The values ranged from 79.1 to 150.9 in men and from 66.7 to 129.2 in women.

With regard to the Nasal Index, most of the males (52 percent) and females (44 percent) belong to 'Mesorhinae' category while 27 percent of the males and 23 percent of the females are in 'Leptorhinae' category. The mean nasal index value is higher among women (76.2) than among the men (71.6). The range of individual values is between 37.5 and 106.5 in men and between 39.7 and 121.9 in women.

Distribution of the Pignet - Vervaeck index values shows that about 52 percent of the males and 56 percent of the females are in the 'broad' category while 37 percent of the males and 36 percent of the females come under 'Medium category. The mean

index value is higher in males (83.7) than in females (81.9). Individual values ranged from 65.4 to 133.2 among men and from 67.5 to 111.2 among females. Distribution of the robusticity index values show that 95 percent of the males and 96 percent of the females are under 'strong' category. The mean index value is higher in males (13.0) than in females (12.2).

The range of values is from 8.9 to 16.7 among males and 8.7 to 15.6 among the females. In the same way, as expected, the mean Ponderal Index value is slightly higher among females (23.9) than among the males (23.3). Individual values ranged from 20.0 to 34.6 among males and from 20.5 to 31.8 among females.

The mean index values are in general, high among males than among females with the exception of ponderal index, nasal index, chervin's cephalic facial index and the upper facial index and some of the differences even attained statistical significance.

It is noticed that the measurement and index values observed among the Kalingas of the present study are closer to those recorded among other caste populations of Andhra Pradesh or falling well within the range observed among the other caste groups.

**Table.1** Details of Anthropometric indices among Kalingas

| Index                                | Males   |         |            | Females |         |            |
|--------------------------------------|---------|---------|------------|---------|---------|------------|
|                                      | Minimum | Maximum | Mean±S.E.  | Minimum | Maximum | Mean±S.E.  |
| 1. Relative Sitting Height Index     | 42.8    | 69.2    | 51.5±0.21  | 38.5    | 63.3    | 51.4±0.17  |
| 2. Relative Biacromial Breadth Index | 14.5    | 31.9    | 22.7±0.11  | 18.2    | 29.8    | 21.8±0.10  |
| 3. Relative Chest Girth Index        | 36.4    | 77.2    | 51.2±0.27  | 43.4    | 68.0    | 50.6±0.22  |
| 4. Cephalic Index                    | 54.9    | 131.2   | 79.3±0.60  | 61.3    | 115.6   | 78.9±0.47  |
| 5. Physiognomic Facial Index         | 107.6   | 158.8   | 129.1±0.59 | 77.6    | 148.6   | 125.9±0.57 |
| 6. Upper Facial Index                | 42.1    | 101.2   | 61.6±0.30  | 53.1    | 105.2   | 61.9±0.34  |
| 7. Jugo – Mandibular Index           | 58.3    | 96.1    | 76.0±0.40  | 59.5    | 118.4   | 74.0±0.42  |
| 8. Chervin's Cephalo – Facial Index  | 79.1    | 150.9   | 97.1±0.58  | 66.7    | 129.2   | 98.4±0.53  |
| 9. Nasal Index                       | 37.5    | 106.5   | 71.6±0.83  | 39.7    | 121.9   | 76.2±0.96  |
| 10. Pignet – Vervaek Index           | 65.4    | 133.2   | 83.7±0.56  | 67.5    | 111.2   | 81.9±0.45  |
| 11. Robusticity Index                | 8.9     | 16.7    | 13.0±0.80  | 8.7     | 15.6    | 12.2±0.74  |
| 12. Ponderal Index                   | 20.0    | 34.6    | 23.3±0.12  | 20.5    | 31.8    | 23.9±0.11  |

**Table.2** Sex Differences in Anthropometric indices among Kalingas

| Index                                | Mean Values |         | Difference in means | 't' value |
|--------------------------------------|-------------|---------|---------------------|-----------|
|                                      | Males       | Females |                     |           |
| 1. Relative Sitting Height Index     | 51.52       | 51.37   | 0.15                | 0.535     |
| 2. Relative Biacromial Breadth Index | 22.71       | 21.85   | 0.86                | 5.745*    |
| 3. Relative Chest Girth Index        | 51.23       | 50.64   | 0.59                | 1.730     |
| 4. Cephalic Index                    | 79.28       | 78.93   | 0.35                | 0.458     |
| 5. Physiognomic Facial Index         | 129.10      | 125.88  | 3.22                | 3.911*    |
| 6. Upper Facial Index                | 61.56       | 61.85   | -0.29               | 0.644     |
| 7. Jugo – Mandibular Index           | 75.98       | 73.95   | 2.03                | 3.498*    |
| 8. Cherviu’s Cephalo Facial Index    | 97.13       | 98.40   | -1.27               | 1.622     |
| 9. Nasal Index                       | 71.58       | 76.25   | -4.67               | 3.667*    |
| 10. Pignet – Vervaeck Index          | 83.68       | 81.87   | 1.81                | 2.531*    |
| 11. Robusticity Index                | 12.98       | 12.19   | 0.79                | 7.306*    |
| 12. Ponderal Index                   | 23.31       | 23.88   | -0.57               | 3.549*    |

\* Value significant at 5% level

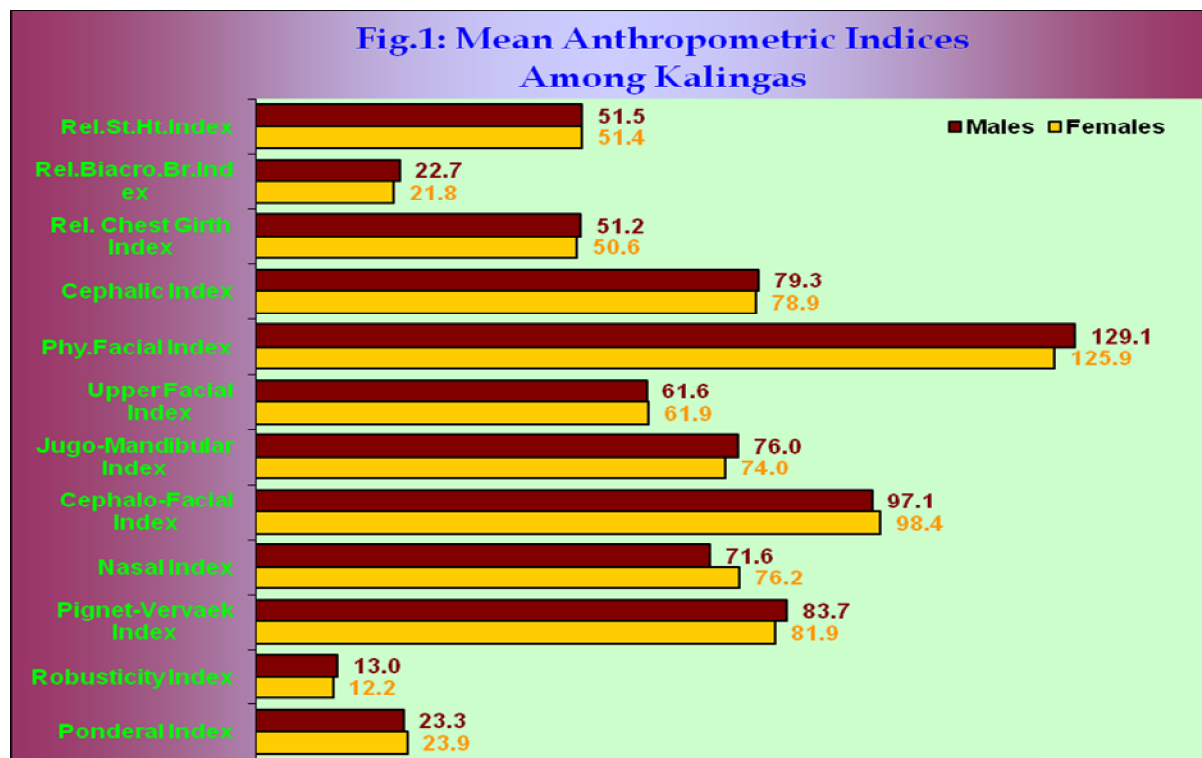
**Table.3** Sex Differences in Anthropometric indices among Kalingas and Details of Anthropometric indices among Kalingas

| Index                                | Males   |         |            | Females |         |            |
|--------------------------------------|---------|---------|------------|---------|---------|------------|
|                                      | Minimum | Maximum | Mean±S.E.  | Minimum | Maximum | Mean±S.E.  |
| 1. Relative Sitting Height Index     | 42.8    | 69.2    | 51.5±0.21  | 38.5    | 63.3    | 51.4±0.17  |
| 2. Relative Biacromial Breadth Index | 14.5    | 31.9    | 22.7±0.11  | 18.2    | 29.8    | 21.8±0.10  |
| 3. Relative Chest Girth Index        | 36.4    | 77.2    | 51.2±0.27  | 43.4    | 68.0    | 50.6±0.22  |
| 4. Cephalic Index                    | 54.9    | 131.2   | 79.3±0.60  | 61.3    | 115.6   | 78.9±0.47  |
| 5. Physiognomic Facial Index         | 107.6   | 158.8   | 129.1±0.59 | 77.6    | 148.6   | 125.9±0.57 |
| 6. Upper Facial Index                | 42.1    | 101.2   | 61.6±0.30  | 53.1    | 105.2   | 61.9±0.34  |
| 7. Jugo – Mandibular Index           | 58.3    | 96.1    | 76.0±0.40  | 59.5    | 118.4   | 74.0±0.42  |
| 8. Chervin’s Cephalo – Facial Index  | 79.1    | 150.9   | 97.1±0.58  | 66.7    | 129.2   | 98.4±0.53  |
| 9. Nasal Index                       | 37.5    | 106.5   | 71.6±0.83  | 39.7    | 121.9   | 76.2±0.96  |
| 10. Pignet – Vervaeck Index          | 65.4    | 133.2   | 83.7±0.56  | 67.5    | 111.2   | 81.9±0.45  |
| 11. Robusticity Index                | 8.9     | 16.7    | 13.0±0.80  | 8.7     | 15.6    | 12.2±0.74  |
| 12. Ponderal Index                   | 20.0    | 34.6    | 23.3±0.12  | 20.5    | 31.8    | 23.9±0.11  |

\* Value significant at 5% level

**Table.4** Mean values of some Body Indices in Andhra Caste Populations

| Population           | Cephalic Index | Nasal Index | Cephalo Facial Index | Source             |
|----------------------|----------------|-------------|----------------------|--------------------|
| <b>M a l e s</b>     |                |             |                      |                    |
| Kalingas             | 79.28          | 71.58       | 97.13                | Present study      |
| Jalaris              | 74.92          | 81.65       | 93.31                | A.U. Reports, 1969 |
| Kammas               | 75.77          | 75.62       | 86.10                | A.U. Reports, 1973 |
| Kapus                | 75.45          | 80.54       | 90.50                | A.U. Reports, 1970 |
| Rajakas              | 75.04          | 84.20       | 82.50                | Parvatheesam, 1995 |
| Vadabaliyas-I        | 74.40          | 85.76       | 93.16                | A.U. Reports, 1969 |
| Vadabaliyas-II       | 74.40          | 70.34       | 87.07                | A.U. Reports, 1977 |
| <b>F e m a l e s</b> |                |             |                      |                    |
| Kalingas             | 78.93          | 76.25       | 98.40                | Present study      |
| Brahmins             | 73.08          | 69.62       | 81.45                | A.U. Reports, 1973 |
| Kammas               | 73.60          | 64.00       | 85.00                | A.U. Reports, 1973 |
| Kapus                | 72.69          | 51.20       | 72.12                | A.U. Reports, 1970 |
| Rajakas              | 76.95          | 70.27       | 78.43                | Parvatheesam, 1995 |
| Vadabaliyas          | 72.73          | 66.13       | 95.14                | A.U. Reports, 1977 |



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