

## Study on Anthropogenetic Traits in a Caste Group of Andhra Pradesh

G. Bulliyya

### INTRODUCTION

Indian population is divided in to a large number of endogamous sub-populations consisting of different castes, languages, religions and tribes. These populations offer the opportunities to study the genetic variation among them. The existence of genetic variation in man is caused by many factors among which selection, migration, gene flow and genetic drift are the most important (Bhasin et al., 1992). The tongue movements (rolling and folding) in man have attracted many workers since long as genetic traits because of their population variations (Sturtevant, 1940; Gahres, 1952; Bat Miriam, 1962).

The ability to roll and fold lateral edges of the tongue in U shape is reported to be due to a significant dominant gene and a recessive gene is responsible for its inability (Hsu, 1948). Later, Liu and Hsu (1949) have expressed that inability to fold tongue is due to a dominant gene and its ability to roll is due to a recessive gene. The genes for tongue folding are situated at a different locus than the genes for tongue rolling. However, many researchers have opined that these traits are not genetically controlled and difference in the patterns are probably due to habits formed early in life (Whittinghill, 1970). Although the genetic mechanism is still unclear, these traits seem to be of great value from Physical Anthropologists point of view in studying human diversity and population variation (Gandhi, 1976; Das et al., 1985).

Many population groups in India have been investigated for these anthropogenetic traits (Som, 1970; Das and Mahapatra, 1976; Garg, 1986; Sidhu and Singhal, 1991; Bhasin and Khanna, 1994; Sengupta and Chetry, 1996; Bhattacharya, 1997). On the other hand, data is available for a few caste groups in the state (Sethuraman et al., 1978; Narahari, 1982; Parvatheesam and Babu, 1997; Reddy and Reddy, 2000). Therefore, an attempt has been made to investigate the frequency distribution of tongue rolling and tongue folding among the Vannekula

Kshatriya caste population in Chittoor, the southernmost district of Andhra Pradesh.

### MATERIALS AND METHODS

Vannekula Kshatriya is numerically a small endogamous population spread over the southern part of Chittoor district. They are supposed to be the original inhabitants of Tamil Nadu migrated to Andhra since long for livelihood. Besides their mother tongue Tamil, can speak local Telugu language fluently to communicate with others. They claim that fishing is their traditional profession, though some are predominantly labourers and some are having agricultural lands. The family is generally nuclear and majority are illiterates due to their poor socioeconomic conditions.

The field study was conducted from two villages of Chittoor district. Data on tongue rolling and tongue folding was obtained from a random sample of 215 unrelated adult male (125) and female (90) aged 20 years and over. Standard methods were applied in recording the ability for tongue rolling (Sturtevant, 1940) and tongue folding (Liu and Hsu, 1949). Each of the subjects was asked to roll the two lateral edges of the tongue without the aid of teeth. Those who could roll the tongue were identified as roller and those who could fold the tongue were designated as folder. For the study of combination of tongue movements, four types were recorded namely R-F, one can roll and fold, R-N, one can roll but not fold, N-F one can fold but not roll, and N-N, one can not both roll and fold. Sexes have been treated separately considering sexual dimorphism. Using the  $\chi^2$  (Chi-square) - test, differences in inter population comparisons were evaluated for statistical significance.

### RESULTS AND DISCUSSION

Table 1 shows the frequency distributions of tongue rolling and tongue folding among the Vannekula Kshatriyas. The type of tongue rolling

**Table 1: Distribution of tongue rolling and tongue folding the among Vannekula Kshatriya of Andhra Pradesh**

| Character                                     | Male<br>(125) | Female<br>(90) | Total<br>(215) |
|-----------------------------------------------|---------------|----------------|----------------|
| <i>Tongue Rolling</i>                         |               |                |                |
| Rollers                                       | 27.2<br>(34)  | 35.6<br>(32)   | 30.7<br>(66)   |
| Non-rollers                                   | 72.8<br>(91)  | 64.4<br>(58)   | 69.3<br>(149)  |
| Male vs Female $\chi^2_1 = 1.6990$ $P > 0.05$ |               |                |                |
| <i>Tongue Folding</i>                         |               |                |                |
| Folders                                       | 20.0<br>(25)  | 28.8<br>(26)   | 23.7<br>(51)   |
| Non-folders                                   | 80.0<br>(100) | 71.2<br>(64)   | 76.3<br>(164)  |
| Male vs Female $\chi^2_1 = 2.2516$ $P > 0.05$ |               |                |                |

Figures in parentheses show the number.

and tongue folding, is less common than non-rolling and non-folding, respectively. The incidence of tongue rolling and tongue folding is more frequent in females (35.6% and 28.8%) than in males (27.2% and 20.0%), however, the difference does not show statistical significance.

Table 2 represents the combinations of tongue movement among the Vannekula Kshatriyas. The frequency of type R-F (rollers and folders) is observed to be lowest among the male (8.8%) and female (13.3%), while highest frequency of type

**Table 2: Combinations of tongue movement among the Vannekula Kshatriya of Andhra Pradesh.**

| Combinations of tongue movement  | Male<br>(125) | Female<br>(90) | Total<br>(215) |
|----------------------------------|---------------|----------------|----------------|
| R-F. Rollers and folders         | 8.8<br>(11)   | 13.3<br>(12)   | 10.7<br>(23)   |
| R-N. Rollers and non-folders     | 18.4<br>(23)  | 22.2<br>(20)   | 20.0<br>(43)   |
| N-F. Non-rollers and folders     | 11.2<br>(14)  | 15.6<br>(14)   | 13.0<br>(28)   |
| N-N. Non-rollers and non-folders | 61.6<br>(77)  | 48.9<br>(44)   | 56.3<br>(121)  |

Figures in parentheses show the number.

Male vs Female  $\chi^2_3 = 3.6761$ ,  $p > 0.05$ .

N-N (non-rollers and non-folders) seen among the male (61.6%) and female (48.9%). The  $\chi^2$  value indicate that a non-significant bisexual difference in the combination traits of tongue movement. However, sex variation is reported to be significant among the six caste populations of West Bengal (Bhatta-charya, 1997).

Among the population groups of India, the

frequency of tongue rolling ranged from 35.7% in Bhoksa of Uttar Pradesh (Garg, 1986) to 97.7% in Kashmiri Bodhs and Dogra Rajputs of Jammu and Kashmir (Bhasin and Khanna, 1994). The incidence of tongue rolling vary greatly among the caste populations of Andhra Pradesh, it ranges from 28.5% in Kodide Reddi (Reddy and Reddy, 2000) to 80.7% in Nayi Brahmin (Bhasha, 1980).  $\chi^2$  analysis reveals statistical significant difference when the study population is compared with caste populations such as Nandimandalam Kshatriya (42.9%; Raju, 1982), Rajaka (45.2%; Parvatheesam and Babu, 1997), Srivaishnava (43.6%; Sethuraman et al., 1978), Pedakanti Reddi (44.5%), Motati Reddi (48.0%), Desuri Reddi (50.0%; Reddy and Reddy, 2000) and Nayi Brahmin (80.7%; Bhasha, 1980).

The incidence of tongue folding of the study sample is observed to be low when compared to other populations of the state. There is a wide range of variation in its incidence, ranges between 7.1% in Kapu (Naidu, 1974) and 84.9% in Nandimandalam Kshatriya (Raju, 1982) among caste and between 54.9% in Bagatha and 23.3% in Yerukula (Narahari, 1882) among tribal groups. On applying  $\chi^2$ -test with Vannekula Kshatriya, all these groups indicating significant heterogeneity for the trait of tongue folding with Rajaka (33.9%; Parvatheesam and Babu, 1997), Desuri Reddi, Molta Reddi, Pedakanti Reddi, Kodide Reddi (37.5%, 49.0%, 51.0%, 61.5%; Reddy and Reddy, 2000) and Madiga (38.4%; Reddy and Reddy, 1994).

In conclusion, the overall distribution of these traits show rather a low and heterogeneous with counterpart population groups of the state. Further, more work has to be done in Andhra Pradesh as well as in adjacent states, in order to understand the distribution pattern of these anthropogenetic traits in south India.

## ACKNOWLEDGEMENTS

Author is indebted to Prof. T. Ramachandraiah, under whose supervision this study has been carried out. Thanks are also due to all the participants for extending constant cooperation in this study.

**KEY WORDS** Anthropogenetic Traits. Caste. Andhra Pradesh

**ABSTRACT** The present study reports the anthro-pogenetic traits such as tongue rolling and tongue folding of the

Vannekula Kshatriya caste population of Andhra Pradesh in a sample of 125 male and 90 female subjects aged over 20 years. The frequency distribution of tongue rolling and tongue folding is lower than non-rolling and non-folding. The proportion of rollers and folders among males are much less than their female counterparts. These traits fail to establish statistically significant bisexual variation. There is no significant association between the combinations of tongue rolling and tongue folding. The Vannekula Kshatriya caste population shows significantly lower frequencies of tongue rolling as well as tongue folding with majority of the neighbouring populations of the state.

## REFERENCES

- Bat Miriam, M.: A survey of some genetical characters in Ethiopian Tribes tongue folding and tongue rolling. *Am. J. Phys. Anthropol.*, **6**: 198-199 (1962).
- Bhasha, S.S.: *Morphological Characters and Colour Blindness in Two Endogamous Groups of Nayi Brahmins, Chittoor District, Andhra Pradesh*. M.Sc Dissertation, S.V. University (Unpublished), Tirupati (1980).
- Bhasin, M.K., Walter, H. and Danker-Hopfe, H.: *The Distribution of Genetical, Morphological and Behavioural Traits Among the People of the Indian Region*. Kamla-Raj Enterprises, Delhi (1992).
- Bhasin, M.K. and Khanna, A. : Study of behavioural traits among nine population groups of Jammu and Kashmir. *J. Hum. Ecol.*, **5**:131-134 (1994).
- Bhattacharya, S.: A study on tongue rolling and tongue folding in various Bengali castes of western Bengal. *Man in India*, **77**: 83-91(1997).
- Das, B.M., Das, P.B., Walter, H. and Danker-Hopfe, H.: Anthropological studies in Assam, India. Observations of five Mongoloid populations. *Anthrop. Anz.*, **43**: 193-204 (1985).
- Das, P.B. and Mahapatra, U.D.: Tongue rolling: A genetic trait in some populations of Assam. *63rd Ind. Sci. Cong., Assam. Part III, Abstract 2*. Dibrugarh (1976).
- Gahres, E.D.: Tongue rolling and tongue folding and other hereditary movements of the tongue. *J. Heredity*, **43**: 221-225 (1952).
- Gandhi, P.: Tongue rolling and tongue folding among five endogamous groups of Jains. *Paper Presented at 3<sup>rd</sup> Annual General Conference of Ethnographic and Folk Culture Society, Lucknow. Abstract* (1976).
- Garg, S.K.: Tongue rolling and tongue folding among the Bhoksa of Western Doon. *Human Science*, **35**: 128-133 (1986).
- Hsu, T.C.: Tongue upfolding. *J.Heredity*, **39**: 187-188 (1948).
- Liu, T.T. and Hsu, T.C.: Tongue rolling and tongue folding a sample of Chinese population. *J. Heredity*, **40**: 19-21 (1949).
- Narahari, S.: Rolling and folding and pigmentation of the tongue among Yanadis of Andhra Pradesh. *Ind. J. Phys. Anthropol. Hum. Genet.*, **7**: 103-111 (1982).
- Naidu, J.M.: *Genetic Survey of Seven Endogamous Populations in Seven Districts of Andhra Pradesh*. M.Sc Dissertation, S.V.University (Unpublished), Tirupati (1974).
- Parvatheesam, C. and Babu, B.V.: A study on morpho-behavioural traits among Rajaka caste of Andhra Pradesh. *J. Hum. Ecol.*, **8**: 147-148(1997).
- Raju, M.M.: *ABO and Rh(D) Blood Groups and Some Morphogenetic Characters in Two Endogamous Groups of Kshatriyas of Chittoor district (AP)*. M.Sc-Dissertation, S.V.University (Unpublished), Tirupati (1982).
- Reddy, R.K. and Reddy, V.R.: Behavioural variation of tongue rolling, folding & curling among the Madigas. *Man in India*, **74**: 251-257 (1994).
- Reddy, K.S. and Reddy, V.R.: Tongue rolling and tongue folding among four Reddi subcastes of Andhra Pradesh. *The Anthropologist*, **2**: 63-64 (2000).
- Sengupta, S. and Chetry, H.B.: A note on some morphogenetic variables among the Mishings of Assam. *J. Hum. Ecol.*, **7**: 215-218 (1996).
- Sethuraman, M., Rao, K.V.R., Ramachandraiah, T. and Swamy, K.S.: A study on tongue rolling and tongue folding among Srivaishnava Brahmins of Tirupati, Andhra Pradesh. *Comp. Physiol. Ecol.*, **3**: 53-55 (1978).
- Sidhu, G.K. and Singhal, P.: Some morphogenetical and behavioural traits in the Sunni Muslims of Jammu and Kashmir, India. *J. Hum. Ecol.*, **2**: 99-100 (1991).
- Som, S.: A study on tongue rolling and tongue folding in a Santal sample. *Bull. Anth. Sur. Ind.*, **14**: 258-263 (1970).
- Sturtevant, A.H.: A new inherited character in man: Tongue rolling. *Proc. Nat. Acad. Sci.*, **26**: 100-102 (1940).
- Whittinghill, M.: *Human Genetics and Its Foundation*. Oxford and IBH Publication, Calcutta (1970).

**Author's Address:** Dr. Gandham Bulliyya, Regional Medical Research Centre, Indian Council of Medical Research, Bhubaneswar 751 023, Orissa, India  
E-mail: dirrmrc@dte.vsnl.net.in