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# Ethnobiological Studies from *Manusmruti:* X. The Pioneer Concept of Binomial Nomenclature

Ratnaprava Mohapatra, S. K. Dash and S. N. Padhy

## INTRODUCTION

In our search for the efficacy of the contents of the Vedic age epic *Manusmruti* (more than 2000 B.C.?) with modern scientific perception from ethnobiological point of view, revealed that the compendium is enriched with many scholastic thoughts on Biological Classification, Ecological food chain and assessment of human food habit in trophic level, Use of Ecological indicators, Eugenics and many aspects concerned to vedic *Soma* plant (Dash, 1998). An attempt is made in this communication to find out the nomenclature system in ancient India, which is more of taxonomic importance.

Carolus Linnaeus (1707-1778), a Sweden born naturologist of modern times, is recognised as the father of Biological Taxonomy for his important work reflected in *Genera Plantarum*, *Flora Lapponica* and *Species Plantarum* etc. The binomial nomenclature (which was originally focused by Gaspard Bauhin 1560-1624) system, which is often attributed to the credibility of Linnaeus, postulates that the name of every species of plant or animal consists of only two words, the first word designates the genus and the second the particular species of that genus (Mathur, 1956). Referring to Linnaeus, a comment by Sir William Jones (the founder President of Asiatic Society of Bengal, a judge under East India Company in British India and the pioneer to translate *Manusmruti* into English in the year 1794 in the light of Kulluka Bhatta's interpretation) is as follows (Narahari, ?): "Had only Linnaeus knew Sanskrit, he would have vastly improved his own system of nomenclature".

### Nomenclature Norms in *Manusmruti*

The above suggestions by Sir William Jones unfortunately have not received a serious attention from Indians, though we acclaim that the ancient Indian system of nomenclature as superior to the other systems in use at that particular time (Sivarajan, 1991). Moreover concerned to the naming of human beings much was emphasized in *Manusmruti*, which was on certain basis, phylogenetic and had social and ecological implications as reflected below.

*Mangalyam braahmanasya syaat kshatriyasya balaanwitam,*
*Vaissyasya dhanasanyuktam ssoodrasya tu jugupsitam. (31/II)*

Meaning: Let (the first part of) a Braahmana's name (denote some thing) auspicious, a Kshatriya's be connected with power, a Vaissya's with wealth, but a Ssudra's (express some thing) contemptible (Buhler, 1886).

*Ssarmabad braahmanasya syaadraajnyo raksha samanwitam,*
*Vaissyasya pushtisanyuktam ssoodrasya preshya sanyutam (32/II)*

Meaning: (The second part of) a Braahmana's (name) shall be (a word) implying happiness, of a Kshatriya's (a word) implying protection, of a Vaissya's (a term) expressive of thriving, and of a Ssudra's (an expression) denoting service (Buhler,1886).

The contents of the above two *Sslokas* certainly conform that the idea of naming a person (species) with two parts i.e. binomial nomenclature, was of pioneer origin from *Manusmruti*, and widely adopted in the Indian society irrespective of caste and creed. Of course it must be admitted that the nomenclature system in *Manusmruti* was applicable to human beings only (as it is the compendium of human ethics) but not adopted for plants and animals in India.

### The Basis of Nomenclature

As the human genetic aspects in *Manusmruti* were based on the philosophy of *Guna* (quality; the property and the essence of all things) and *Karma* (means to do, make, perform or action

which obeys the organic laws of cause and effect) (Dash and Padhy, 1998), the same theme is also adopted in nomenclature system. The intellectuals, who guided the society in the right prospective, were considered *Braahamana*; the *Kshatriyas*, who rendered protection to all concern; *Vaissyas* shouldered a broad spectrum of economic responsibility such as business and agricuture and the duty of the *Ssudras* was not very much defined as were uneducated and expected to support the other three classes in order to have a smooth run of the society. In this context no class is considered as neglected one. According to Manu the first part of the name of a person is supposed to express him quality (*guna*; such as auspicious for *Braahama*, power for *Kshatriya*, wealth for *Vaissya* and subdued for *Ssudra*); and the second part represents the social duty implying happiness for *Braahmana* (*e.g. Sarman, Sharma, Devasarma, Dharmadatta, Devabratta* etc), protection for *Kshatriya* (*e.g. Verma, Devaverma, Mahipala, Singha, Gajapati, Dhananjaya* etc); thriving for *Vaissya* (*e.g. Vasudeva,Dhanapala, Ssreshthi, Prushti* etc) and denoting Service for Ssudra (*e.g. Devadasa, Dasa, Mihidasa, Sudasa* etc) (Das, 1995).

**Phyllogenetic Aspects of Nomenclature**

Conservation of genetic trend is much emphasized in *Manusmruti* declaring that there is no fifth *varna* other than the above referred *Chaturvarna* (four fold classification) and admixing of *Varnas* (*Varnassankaras*) was very much discouraged. There is also evidence for the recovery of a higher *varna* from *varassankaras* through suitable back crossing, as done in modern genetic studies (Dash and Padhy, 1998).

The caste based naming of a person following binomial nomenclature according to *Manusmruti*, may not reflect on the genus and species from biological point of view; but certainly has reflection on the *guna* and *karma*, the genetic basis of Hindu philosophy. A person was further marked with two other phyloge- netic factors like *Gotra* and *Prabara*, which he is expected to announce (while giving self-introduction) or implicates (in marriage affairs and other rituals) whenever required. *Gotra* is the name of the original ancestor or sage who gave the name to a family and *Prabara* is the name of a sage who contributed to the continuance of family or tribe (Praharaja, 1937). The markers *Gotra* and *Prabara* enables to find out the ancestors or derivatives of any person (or taxon) may be equal with the generic concept of biology and associated with a person in every day rituals of life, performed from birth to death. This is enough to signify that naming of a person, his caste, *gotra* and *prabara* are more scientific and phyllogenetic as depicted in *Manusmruti*.

**Social and Ecological Implications of Nomenclature**

Above all a special ritual is prescribed '*Naamdhdheya*' for naming the child, which is expected to be celebrated on the 10th or 12th day of the birth or on a lucky lunar day or in a lucky *Muhurtta* (moment) or under an asupicious constellation (*tithi*), which is considered as one of the ten vital *sanskaaras vide Sl* 30/II (as *Garbhaadhaana, Punsabana, Seemantoanayana, Jaatkarma, Naamkarna, Annapraassana, Chudaakarma, Upanayana, Samaavartana, Bibaaha* etc up to 52 types), signifies the social importance of naming. Moreover such system of naming has ecological implications and significant to identify a person and his caste instantly, just by inquiring the name. In addition to name, further markers of identification was expected to be followed by a person for his social recognition as follows:

*Bayasah karmanoarthasya ssrutasyaavijanasya cha,*
*Bessabaagbuddhi ssarupyamaacharan bicharediha (18/IV).*

Meaning: Let him walk here (on earth), bringing his dress, speech and thoughts to a conformity with his age, his occupation (need), his wealth, his sacred learning and his race (Buhler, 1886).

**Nomenclature Principles of Linnaeus and *Manusmruti*, a Comparative Overview**

Most of the Indian science is concealed within the hymns of Sanskrit literature and could not be focused at the global level because of

the barrier of language, as rightly commented by Sir William Jones. Keeping this in view, a comparative account on certain aspects of nomenclature system followed by *Maharshi* Manu and Carolus Linnaeus is depicted in table 1, to evaluate the hidden scientific aspects of ancient literature.

## DISCUSSION

The attempt to drag such comparison as reflected above and the similarity of such nomenclature principle between two schools of thought, even though are widely apart from each other in time and space, glorifies the aspects of ancient Indian scientific insight. As the four fold division of the society as *Braahmana, Kshatriya, Vaissya* and *Ssudra* (not only for human beings but also for all the living creatures based upon the principle of *Guna* and *Karma*), has changed to a birth right and finally emerged to more than 2000 castes in Indian scenario. Similarly the naming pattern is also influenced with the process. Of course, some variations in names can be marked in the Indian society associated with the birth place and the parentage (father's and forefather's) and also with the surname in first part followed by the name proper.

Above all in the present Indian Society, the name, clothings, speech and thoughts co-ordination with age, occupation, wealth, learning and race are heterogeneous, in an unsystematic trend and are incompatible to implement their significance.

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**Table 1: Comparison of certain nomenclature principles (*aphorisms*) followed in *Philosophia botanica* and *Manusmruti***

| *Philosophia Botanica* | *Manusmruti* |
|---|---|
| 1. Author: Carolus Linnaaeus | Revealer: *Maharshi* Manu (*Vaibasswata*) |
| 2. Time: 1707-1778 A.D. | More than 2000 B.C.(imaginary period, truth is questionable) |
| 3. Place: Sweden | India *Aaryaabartta* |
| 4. Principles: | |
| a. Generic names long descriptive, difficult pronounciation, repulsive, must be avoided. | a. Advised for names representing auspicious, power, wealth and humbleness for men (*Sl* 31,32/II) and for women should be easy to pronounce, not imply anything dreadful, possesses a simple (plain) meaning, be pleasing and auspicious, end in long vowels and contain a word of benediction (*Sl* 33/II) which is further reflected in *Sl* 10/III. It is emphasized not to marry a maiden who is named after a constellation, a tree, a river, reflecting on a low caste, a slave, a bird, a snake or if it inspires terror, (*Sl* 9/III). |
| b. A perfectly named species is given a generic and specific name. | b. A perfectly named person has two parts of his name, the first part reflecting on the *guna* and second part on the *karma* attributed to his caste in which he belongs. The *guna* and *karma* are not comparable to genus and species. |
| c. A specific name must distinguish a species from all of his relatives. | c. Just the reverse. The second part of the name is same for the members of a family and racial relations, while the first part distinguishes a person from another. Further many families may carry different surnames coming under one *gotra*. In this context *Gotra* may be attributed to generic and family surname as species. |
| d. A generic name must be applied to each species. | d. If *gotra* and *prabara* are considered from generic point of view, they almost continue with the person being concealed (not reflected in name). |
| e. Specific name (2nd part) should always follows generic name (1st part) | e. Name pertains to *karma* (2nd part) always follows the name related to *guna* (1st part). |
| f. The specific name the shorter it is, the better it be. | f. Usually the second part of the name is known as the surname, which is shorter than the first part, even widely applied in the present day scenario. |
| 5. Applied for: Plants, animals and human beings from biological point of view. | : Human beings only with social and cultural significance. |

**KEY WORDS** Ethnobiology. *Manusmruti*. Binomial nomenclature.

**ABSTRACT** The system of nomenclature adopted in ancient India, as depicted in *Manusmruti*, was binomial in nature and based on phylogenetic principles with social and ecological implications. Comparison between the binomial nomenclature principles as followed by Linnaeus and *Manusmruti* is highlighted in this paper.

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*Authors' Address:* **Ratnaprava Mohapatra**, Ethnobiologists' Forum, Anandamaya, Bhabanagar (L-1), Berhampur 760 004, Orissa, India

**S.K. Dash**, College of Pharmaceutical Sciences, Berhampur (Mohuda) 760 002, Orissa, India

**S.N. Padhy**, P.G. Department of Botany, Khallikote College (Autonomous) Berhampur 760 001, Orissa, India

*Address for Correspondence:* S. N. Padhy

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# Relationship of Blood Glucose Levels with Some Anthropometric, Behavioural and Socio-economic Factors in Reddis of Andhra Pradesh

P. Venkatramana, S. A. Abdul Latheef, T. K. Janardhan, and P. Chengal Reddy

## INTRODUCTION

Non-insulin dependant diabetes mellitus (NIDDM) is one of the most serious diseases among certain ethnic groups such as Amerindian tribes (Sievers and Fisher, 1985), Hispanic Americans, African Americans and native Americans (Enas et al., 1996). McCay et al (1916) first reported the incidence of NIDDM in Bengalis of Indian region. Several authors reported association of various factors with NIDDM. These include increased body mass index (Mohan et al.,1986), age (Ramachandran et al., 1988), hypertension (Zimmet et al., 1981), male gender, urban living, vegetarianism and income (Ahuja, 1979). A decreased risk for NIDDM with increased physical activity was also observed (Kriska et al., 1993). Since, India is a polyethnic country studies involving different ethnic groups are required to explore the possibility of the interaction of genetic and environmental factors leading to the development of NIDDM. Hence, the present study is an attempt to find out the association of various factors in relation to NIDDM in Reddis, a caste population of Andhra Pradesh.

## MATERIALS AND METHODS

The data for the present study were collected from 55 male individuals of the Reddi community from Tirupati town of Chittoor district in Andhra Pradesh. Their age ranged from 20 to 73 years. The Reddis, also called as Kapus, are one of the high income caste groups of Andhra Pradesh. In the sample of the present study, most of them were either having employment or business.

The information on age, monthly income, marital status, physical activity, smoking and alcoholic habits were obtained through personal interview method. The anthropometric measurements such as height (cm), weight (kg), abdominal circumference (cm) and skinfold measurements (mm) at triceps (TSF), biceps (BSF), subscapular (SSF), suprailiac (SISF) and calf (CSF) were recorded following the procedure of Weiner and Lourie (1981). The following four measures of adiposity as described by Hasstedt et al. (1989) were calculated from the anthropometric measurements: (1) Body mass index (BMI) = weight (kg)/height ($m^2$), (2) the sum of the five skinfolds (SF5) = triceps + biceps + subscapular + suprailiac + calf, (3) the ratio of the sum of the trunk to the sum of the extremity skinfolds (TE ratio) = TSF3/(calf + triceps + biceps) and (4) the relative fat pattern index (RFPI) = subscpular/ (subscapular + suprailiac). The conicity index (CI) = Abdominal circumference / $(0.109\sqrt{W/H})$ was calculated according to Valdez et al. (1993). The subjects were classified as under weight, normal and obese based on body mass index (Norgan and Ferrolitzi, 1982). Blood pressure was measured by using mercury sphygmo- manometer as suggested by

**Table 1: Mean values of blood glucose and different variables in the Reddis of Andhra Pradesh**

| *Variable* | *Mean* | *S. D.* | *S. E.* |
|---|---|---|---|
| Blood glucose | 115.2 | 51.97 | 7.01 |
| Age | 47.91 | 9.44 | 1.27 |
| Height | 168.26 | 6.51 | 0.88 |
| Weight | 68.21 | 11.56 | 1.56 |
| Abdominal circumference | 90.01 | 10.11 | 1.36 |
| TSF | 16.65 | 5.54 | 0.75 |
| BSF | 8.53 | 3.16 | 0.43 |
| SSF | 21.11 | 7.62 | 1.03 |
| SISF | 21.10 | 6.47 | 0.87 |
| CSF | 13.42 | 5.24 | 0.71 |
| BMI | 24.04 | 3.76 | 0.51 |
| SF5 | 81.04 | 22.64 | 3.05 |
| TE ratio | 1.11 | 0.24 | 0.03 |
| RFPI | 0.50 | 0.08 | 0.01 |
| CI | 1.30 | 0.07 | 0.01 |
| SBP | 120.55 | 14.86 | 2.00 |
| DBP | 86.76 | 11.35 | 1.53 |

Rose et al. (1980). The systolic blood pressure (SBP) was determined at the point when the Korotkoff sounds become audible, and diastolic blood pressure (DBP) was measured when the Korotkoff sounds completely ceased (phase-V). The fasting blood samples were collected and estimated for glucose levels (Burtis and Ashwood, 1996). Diabetes was diagnosed if the concentration of glucose in fasting serum was >140 mg/dl (WHO, 1985).

## RESULTS

The descriptive statistics for blood glucose levels, age, anthropometric measurements, adiposity measures and blood pressure are presented in table 1. The distribution of different anthropo- metric variables in relation to the mean glucose levels are presented in table 2. This table shows that the highest mean blood glucose levels were found in 50-60 age group. In 60+ age groups the mean blood glucose levels were more or less equal to that of 40-50 age group. Inconsistent trend was observed in relation to BMI, CI, SF5 and RFPI with glucose levels. As the mean of blood glucose values increased, the TE ratio values were also increased. More or less increased systolic and diastolic blood pressure levels with increased glucose levels were observed.

Higher glucose levels were observed in inbred, moderately physically active, smoking, alcoholic individuals and having family history of NIDDM. However, no consistent relationship was observed with income level (Table 3). Table 4 shows the mean and standard deviation values of different variables between normal and diabetic subjects. Higher mean values of age, height, SSF, TE ratio, RFPI, SBP and DBP were observed in diabetic subjects than normals.

## DISCUSSION

The prevalence of NIDDM among South Asians was reported to be about

**Table 2: Means of blood glucose values in relation to the distribution of different anthropometric variables**

| *Age* | *n* | *Blood glucose* | | *BMI* | *n* | *Blood glucose* | | *CI* | *n* | *Blood glucose* | | *SF5* | *n* | *Blood glucose* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* |
| <40 | 4 | 105.00 | 17.38 | <16 | 1 | 97.0 | 0.00 | 1.05-1.10 | 1 | 97.0 | 0.00 | 20-40 | 2 | 92.50 | 4.50 |
| 40-50 | 33 | 107.82 | 42.05 | 16.0-16.9 | 2 | 121.5 | 36.5 | 1.10-1.15 | 1 | 158.0 | 0.00 | 40-60 | 6 | 100.17 | 31.43 |
| 50-60 | 11 | 146.09 | 82.23 | 17.0-18.4 | 3 | 87.33 | 11.02 | 1.15-1.20 | 3 | 82.67 | 6.11 | 60-80 | 17 | 134.53 | 77.59 |
| ≥60 | 7 | 107.29 | 35.50 | 18.5-24.9 | 28 | 121.75 | 66.80 | 1.20-1.25 | 8 | 99.50 | 28.74 | 80-100 | 21 | 109.38 | 34.14 |
| | | | | 25.0-29.9 | 16 | 115.19 | 33.03 | 1.25-1.30 | 14 | 107.86 | 23.09 | 100-120 | 7 | 93.43 | 15.40 |
| | | | | 30.0-33.9 | 5 | 96.40 | 9.61 | 1.30-1.35 | 17 | 138.71 | 81.33 | ≥120 | 2 | 156.00 | 43.00 |
| | | | | | | | | 1.35-1.40 | 8 | 105.50 | 32.84 | | | | |
| | | | | | | | | 1.40-1.45 | 3 | 108.33 | 25.42 | | | | |

| *TE ratio* | *n* | *Blood glucose* | | *RFPI* | *n* | *Blood glucose* | | *SBP* | *n* | *Blood glucose* | | *DBP* | *n* | *Blood glucose* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* |
| <0.8 | 6 | 96.50 | 22.6 | 0.25-0.30 | 1 | 81.00 | 0.00 | 90-100 | 5 | 91.20 | 11.39 | <70 | 5 | 84.80 | 3.11 |
| 08-1.0 | 8 | 103.25 | 30.5 | 0.30-0.35 | 0 | - | - | 100-110 | 7 | 104.43 | 26.92 | 70-75 | 3 | 85.33 | 10.69 |
| 1.0-1.2 | 22 | 106.77 | 34.0 | 0.35-0.40 | 3 | 87.67 | 8.33 | 110-120 | 14 | 110.79 | 15.00 | 75-80 | 3 | 93.67 | 20.43 |
| 1.2-1.4 | 13 | 137.31 | 87.2 | 0.40-0.45 | 9 | 93.11 | 5.67 | 120-130 | 18 | 111.11 | 36.00 | 80-85 | 15 | 105.07 | 29.53 |
| ≥1.4 | 6 | 132.83 | 40.7 | 0.45-0.50 | 11 | 120.36 | 11.17 | 130-140 | 3 | 89.67 | 11.59 | 85-90 | 4 | 95.25 | 19.60 |
| | | | | 0.50-0.55 | 18 | 117.17 | 10.06 | 140-150 | 5 | 164.60 | 101.30 | 90-95 | 12 | 116.33 | 41.06 |
| | | | | 0.55-0.60 | 7 | 101.57 | 6.42 | 150-160 | 3 | 168.53 | 69.53 | 95-100 | 6 | 150.67 | 76.59 |
| | | | | 0.60-0.65 | 6 | 168.33 | 49.19 | | | | | 100-105 | 3 | 156.00 | 30.11 |
| | | | | | | | | | | | | ≥105 | 4 | 162.50 | 122.11 |

20%. The incidence of NIDDM in India has been reported from 1.8% (Ahuja, 1979) to 5% (Ramachandran et al.,1988). The prevalence of diabetes among migrant Indians has been reported to be high (Zimmet et al., 1983; King et al., 1968). Though the prevalence of diabetes is believed to be low among Indians in India (Ahuja, 1979), the reports from Darjeeling and Karnataka (Ramachandran et al., 1988) showed that the prevalence of diabetes is higher among urban Indians and was not different from that seen in migrant Indians (Ahuja, 1979; Verma et al., 1986). In the present study, we have observed that the prevalence of NIDDM was as high as 14.5%. This is much higher than the earlier studies. According to Zimmet (1992) and Jarrett (1989), the prevalence of diabetes is known to vary widely between populations belonging to different geographical, cultural and socio-economic groups of the world. In any population which undergoes urbanisation, modernisation or life style changes, the prevalence of diabetes generally tends to increase. Accordingly, a high percentage of diabetes in the present study sample might be due to urbanisation and rapidly changing life styles of Reddis of Andhra Pradesh.

Zimmet et al. (1988) in a study on South pacific population reported that NIDDM increases with age. He observed that prevalence rate reached peak at the age of 60 after which it declined. A study from Chickmangulur district of Karnataka by Ramachandran et al. (1988) also reported peak prevalence (41%) of diabetes in the age group of 55-64. In the present study increased blood glucose levels were observed in the age group of 50-60 and after that decreased levels of glucose were observed. This is because the older people may be at risk for malnutrition because of isolation, depression, poverty and other coexisting factors. Mohan et al. (1986) in a prospective study in Israel found increasing risk of diabetes with increasing body mass index. In the present study four fat indices BMI, CI, SF5 and RFPI have shown inconsistent relationship with blood glucose levels.

**Table 3: Means of blood glucose levels in relation to the distribution of different socio-economic variables**

| *Smoking level* | *n* | *Blood glucose* | | *Physical activity* | *n* | *Blood glucose* | | *Alcoholic consumption* | *n* | *Blood glucose* | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* |
| No | 40 | 112.85 | 41.99 | Low | 27 | 107.56 | 43.68 | No | 48 | 112.00 | 43.58 |
| Low | 9 | 115.44 | 49.88 | Medium | 28 | 122.57 | 58.72 | Occassional | 7 | 137.14 | 93.71 |
| Medium | 6 | 130.50 | 105.39 | | | | | | | | |
| *Type of marriage* | *n* | *Blood glucose* | | *Income level (Rs.)* | *n* | *Blood glucose* | | *Family history of NIDDM* | *n* | *Blood glucose* | |
| | | *Mean* | *S. D.* | | | *Mean* | *S. D.* | | | *Mean* | *S. D.* |
| Non-Inbred | 42 | 118.12 | 55.30 | <6000 | 7 | 88.43 | 13.93 | No | 45 | 111.00 | 44.68 |
| Inbred | 13 | 105.77 | 39.74 | 6000-8000 | 9 | 131.67 | 83.78 | Yes | 10 | 134.10 | 77.20 |
| | | | | 8000-10000 | 4 | 108.75 | 16.68 | | | | |
| | | | | 10000-12000 | 22 | 121.50 | 57.32 | | | | |
| | | | | 12000-14000 | 7 | 124.14 | 30.87 | | | | |
| | | | | 14000-16000 | 2 | 101.50 | 13.50 | | | | |
| | | | | ≥16000 | 4 | 88.00 | 8.29 | | | | |

**Table 4: Means of different variables in the normal and diabetic individuals**

| *Variable* | *Normal (n=47)* | | *Diabetic (n=8)* | |
|---|---|---|---|---|
| | *Mean* | *S.D.* | *Mean* | *S.D.* |
| Age | 47.38 | 9.63 | 51.00 | 8.09 |
| Income | 10146.17 | 4668.34 | 9937.50 | 2145.39 |
| Height | 168.12 | 6.78 | 169.08 | 4.89 |
| Weight | 68.37 | 11.69 | 67.25 | 11.48 |
| Abdominal circumference | 90.24 | 10.08 | 88.66 | 10.89 |
| TSF | 16.79 | 5.46 | 15.88 | 6.29 |
| BSF | 8.55 | 3.30 | 8.38 | 2.33 |
| SSF | 20.83 | 7.32 | 22.75 | 9.60 |
| SISF | 21.28 | 6.36 | 20.00 | 7.43 |
| CSF | 13.96 | 5.30 | 10.25 | 3.69 |
| BMI | 24.14 | 3.88 | 23.43 | 3.15 |
| SF5 | 81.68 | 22.24 | 77.25 | 26.13 |
| TE ratio | 1.09 | 0.25 | 1.23 | 0.17 |
| RFPI | 0.50 | 0.08 | 0.53 | 0.07 |
| CI | 1.30 | 0.07 | 1.29 | 0.09 |
| SBP | 118.85 | 13.80 | 130.50 | 17.91 |
| DBP | 85.32 | 11.27 | 95.25 | 7.92 |

Mohan et al. (1986) stated that the obesity is not common in Indian diabetes. This was also confirmed by Ramachandran et al. (1988). But in the present study only TE ratio had shown significant relationship with blood glucose levels.

Zimmet et al. (1981) had shown a positive association between hypertension and diabetes. In the present study more or less similar trend was observed. Kriska et al. (1993) reported a reduction in the diabetes due to increased physical activity. In the present study increased blood glucose levels with moderate physical activity were observed. This may due to other factors such as family history. Ahuja (1979) reported a marked association between income and diabetes. In the present study inconsistent relationship was found with income.

A stepwise multiple regression analysis was done to see the influence of age, blood pressure and five fat distribution phenotypes on blood glucose levels as well as the influence of seven socio- economic variables on blood glucose levels. The multiple correlation (R) for age, BMI, SF5, TE ratio, RFPI, CI, SBP and DBP was 0.55. The coefficient of variability ($R^2$) due to these eight variables was a little over 30% i.e. a significant contribution of variability of blood glucose is being expressed by these eight variables. However, in the case of other eight variables such as type of marriage, physical activity, food habits, smoking, alcoholism, family history and income, the R value was 0.31 and the $R^2$ was only about 10 per cent.

Over all, from the results of the present study it can be concluded that some of the variables under study are influencing blood glucose levels among Reddis and in turn may be contributing to the development of the non insulin dependant diabetes mellitus among them.

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**KEY WORDS** Blood Glucose Levels. Anthropometry. Physiological Parameters. Behavioural Parameters. Socio-economic Factors. NIDDM.

**ABSTRACT** Data on the distribution of blood glucose levels and associated factors of non insulin dependant diabetes mellitus (NIDDM) such as blood pressure, obesity and social factors were collected randomly from 55 male individuals of Reddis of Tirupati town of Andhra Pradesh. The results showed that 14.4 per cent of subjects were diabetic and others were normal. The glucose levels showed positive relationship with age, TE ratio, systolic blood pressure and diastolic blood pressure, but in case of other variables inconsistent relationship was observed. Low glucose levels were noticed in non-smoking, non-alcoholic, low physically active, inbred individuals and having no family history of NIDDM than the others. In conclusion, from the results of the present study indicate that some of the variables under study were influencing glucose levels and may in turn leads to the development of NIDDM.

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*Authors' Address:* **P. Venkatramana, S. A. Abdul Latheef, T. K. Janardhan, and P. Chengal Reddy**, Department of Anthropology, Sri Venkateswara University, Tirupati 517 502, Andhra Pradesh, India