CHAPTER - I

INTRODUCTION

Anthropology is one of the social sciences that deals with the social, cultural and biological aspects of man. According to Kottak, Anthropology is the study of human species, its immediate ancestors and its approach is holistic. The study includes whole of the human condition; past, present and future (2002-C.D). The term Anthropology is derived from the Greek words ‘Anthropos’ meaning Man and ‘logos’ meaning study. The field anthropology can be mainly divided into two branches namely Biological anthropology and Cultural anthropology.

The field Cultural anthropology studies man as a social animal. It is the study of human social organization and culture. The Biological anthropology deals with the mechanisms of biological evolution, genetic inheritance, human adaptability and variation; primatology, primate morphology and the fossil record of human evolution. According Kottak there are five special interests within the Biological anthropology

1. Paleo-anthropology: human evolution as revealed by the fossil record,
2. Human genetics,
3. Human growth and development,
4. Human biological plasticity: the body’s ability to change as it copes with stresses such as heat, cold and altitude,


As one can speak of the phenotype of an individual; one can also speak of the phenotype of the population. While studying human variation, one should take into account the interaction of cultural and other environmental factors along with genetic processes. Most of the recent biological studies are on population genetics.

1.1 POPULATION GENETICS

Population genetics is the branch of evolutionary biology responsible for investigating processes that cause changes in allele and genotype frequencies in populations based upon Mendelian inheritance. Population geneticists usually define evolution as any change in a population genetic composition over time. Population genetics looks at changes in gene frequencies at the level of the community or breeding population. Inheritances of traits for humans are based upon Mendel’s model of inheritance. Hence, Biological Anthropologists consider unit of population as Mendelian population. Such ideal units in India are tribes or castes where people are highly endogamous.

There are number of variables used by Biological anthropologists while studying human variation. The following mentioned parameters are often used for genetic analysis and comparison of populations,
1. Anthropometries,

2. Dermatoglyphics,

3. Genetic Markers.

Anthropometries and Dermatoglyphics are polygenic and are polymorphic in their expression. Therefore, these two parameters are more useful for the assessment of biological affinities in the classification of populations. Genetic markers are controlled by a pair of genes, whose inheritance can be understood clearly hence, they are more useful in studying individual differences.

1.2 ANTHROPOMETRICS

Somatometric measurements and somatoscopic observations have been used such a long time to define differences between human groups. The somatometry includes various measurements of the external physical characteristics of the body such as stature, sitting height, head length, head breadth etc. The somatoscopic observations are qualitative expressions of skin and hair colour; hair form, shape of nose and chin; and the like are used. All these characters are controlled by many number of genes hence, they are polymorphic in their expressions. These morphological characters are further modified by the external environment and nutrition. Even though there are errors involved while recording body measurements or the degree of subjectivity involved in
somatoscopic observations, we can still continue to use these characters for differentiating human populations with suitable precautions. These measurements are inexpensive and provide the greater variety of genome. Thurston in 1909, Risely 1915 and Eickstedt in 1934 have collected large quantity of anthropometric data from various endogamous groups of India and classified them on the basis of different racial elements.

1.3 GENETIC MARKERS

Many phenotypic traits are controlled by a pair of alleles and are inherited in a simple Mendelian fashion. They remain constant throughout life of an individual. They are less influenced by nutrition and environment therefore; the genetic markers have greater importance in the population genetics. The following mentioned genetic markers are frequently used by Biological anthropologist.

1. Red cell antigens
2. Hemoglobin
3. Red cell Enzymes
4. Serum protein
5. Miscellaneous

Among all the genetic characters, blood groups have been extensively analyzed to understand genetic structure of human populations. Mourant (1976) opines that blood groups are a much more
direct consequence of genetic constitution than the external morphological characters of human beings. In the present study ABO and Rh blood groups have been studied.

1.4 GENEALOGICAL INFORMATION

Genealogical data obtained by using pedigree charts are useful to estimate the relationship between individuals and the degree of departure from random mating; composition and size distribution of the population can be studied by using genealogical charts.

1.5 REVIEW OF LITERATURE

Many biological studies have been carried out on different endogamous groups by many Biological anthropologists in different parts of India. A few are mentioned below.

A very little population studies have been conducted on the people of Karnataka. The two groups of Lingayat namely Jangam and Sadaru of Bellary District of Karnataka were studied by Risley (1901). This was probably the first anthropometric study conducted in Karnataka. Thurston (1909) provides a brief ethnographic account on the Aadikarnatakas (Holey). Hawkes (1914) studied the morphological differences in human foot; the study was based on the big toes. The relative length of the big toe was greater than second toe. He also observed a few cases were first toe was smaller than the second. There were few cases where first and second toes were equal in size.
Iravati Karve (1954) has collected various anthropometric measurements from many populations of Karnataka. The work of Basu (1971) reveals the dermatoglyphic and anthropometric variation in the population. 100 individuals belonging to seven different ethnic groups have been measured for 14 characters by Ahmad and Danda (1981). Pavate (1985) has carried out a detailed biological study on the Siddhi of Karnataka. He has collected anthropometric, dermatoglyphic, demographic and serological data. His study supports the view that the Siddhi have African origin. An anthropo-genetic study on Kunbi, Karnataka was carried out by Bellad (2006). He has recorded seventeen morphological measurements from 1264 males and female individuals of Kunbi community. He also analyzed 700 blood samples. Kunbi show the lower frequency of A gene and high frequency of B gene when compared with many populations of Karnataka.

Das (1988) has collected somatometric data from different castes and tribes of Assam. The somatic variations observed were mainly in the linear measurements.

The restudy on the Onge of little Andaman Island was carried out by Awaradi (1992). He has collected seventeen measurements on 22 males and 24 females. According to him the Onge belong to ploytrrhinic category. Anthropometric study on the Nicobarese was carried out by
Gopal Krishna and his group (1994). Nine anthropometric measurements were recorded on 50 male and 50 female Nicobare. The males show higher mean values for all the measurements when compared to females. Shrawan Kumar (1992) has carried out a serological study on Onge. He observed that the blood pressure and blood cholesterol levels were normal but the incidence of HBs Ag was found to be very high (48.00 per cent).

Prakash Patil (1998) has undertaken biomedical study on the Siddhi of Karnataka. He has also analyzed blood samples for ABO and Rh blood groups. Reddy and Papa Rao (1999) have examined anthropometric variation between the Madhiga and Mala of Andhra Pradesh. Both these groups show heterogeneity in majority of the anthropometric measurements.

Sharada Sidhu (2003) has collected 1150 blood samples from the Harijan settlements in Amritsar and Mogar districts of Punjab. The frequency of B gene was more to A and the frequency of Rh-ve was less than 3.00 per cent.

Manoj Jain et al., (2003) have conducted extensive genetic study on the four Neo-Buddhist sub-groups namely Bawane, Kosar, Ladwan and Barke of Nagpur city. 410 individuals were tested for A1A2BO, Rh (D) blood groups and HBs, β-Thalassamia and G6PD deficiency.
The secular trends in height and weight were studied on Bangladeshi female students by Golam Hossian and his group (2004). The samples were classified into 19 groups according to measurement year from 1985 to 2008. The regression coefficient in body mass index was negative.

Gangadhar (2005) has made an extensive study on Aadikarnataka people of Mysore. He has collected demographic, serological, somatometric, dermatoglyphic and morpho-behavior variations.

Singh (2005) has collected 200 blood samples from two tribal groups namely Tarai foothill and Bhokhsa of Northern India. The samples were tested for A_1, A_2, B, MN, Rh (D), ABH (O) secretion in saliva. A_1 blood group predominates in both the groups and Rh-ve frequency ranges from 12.00 to 14.00 per cent.

Balgir (2005) has carried out an extensive study on fifteen major scheduled tribes of Orissa. His serological study reveals that prevalence of Rh (-ve) was low (8.00 per cent) and ABO blood group distribution showed significant variance when compared with other tribal populations of India.

Jai Prabhakar et al., (2005) have collected serological data from Vishwakarma of Hosahundi village, near Mysore city. Samples were tested for ABO and Rh (D). Incidence of O was recorded highest followed by B. The Rh-ve frequency was found around 3.2 per cent.
Subhashini (2007) has carried out a serological study on Irula (A Tribe) of Pondicherry. She has collected 200 samples and tested for ABO and Rh (anti D) blood groups. The Irula exhibit highest frequency of B allele, followed by O and A. 93.00 per cent of the population exhibit Rh factor positive (Rh+ve)

A study on Anthropometry and physical performance of rural school girls was conducted by Poonam and Rita (2007). The physical performance was determined by running test. Height and weight of the subjects were higher than the ICMR standards. Kiranmala Devi and Goutam Kshatriya (2007) have conducted serological study on Koyers of Andhra Pradesh. O Allele was more frequent, followed by B Allele. Rh-ve was around 16.00 per cent.

1.6 OBJECTIVES OF THE STUDY

The Gunagi is a small interesting group living in Uttara Kannada district of Karnataka. This is the first anthropometric and serological study on this community. The following attempts will be made in the present research.

1. To collect genealogical data.
2. To collect anthropometric data.
3. To collect blood samples and to classify them into ABO and Rh blood groups.
4. The results of Gunagi will be compared with the results of Daivajna Brahmin to see how far these two groups vary from each other.

5. The results of the present data will be compared with the results of such studies carried out on other populations of Karnataka.