

# POPULATION STRUCTURE OF IRULAS IN NILGIRIS

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## **Abstract**

Population structure to demographers means the age and sex composition of the population which they utilise for building up of the population projections. It varies in time and space as a consequence of births and deaths as well as selective migration. For population geneticists, population structure means and variances of births, deaths, number of children, mortality, mating size and breeding structure of the population, their effective population size admixture rate, and such other characters which throw light on genetic processes in the respective populations.

**Keywords:** Anthropology, genetic, population, sex, Economic, Agricultural settlement

## **Introduction**

Systematic anthropological demographic studies, with reference to India, are very few. The first pioneering work comes from Basu (1969) among the Pahira, a small tribe distributed in West Bengal and Bihar. The second detailed study has been reported on the Kota of the Nilgiri Hills, Tamil Nadu, by Ghosh (1976). Susmita Talukdar (1979) made a similar study on “genetical demography of two Dule Bagdi demes”. Besides, there are studies on various populations focusing on certain aspects of demography (Dronam raju and Meera Khan, 1960; Dronam Raju, 1964; Rakshit, 1972; Mukherjee, D.P., 1974; Chaudhary and Kumar, 1976). However, the need for research in anthropological demography (Rakshit, 1976), and prospects of population genetical work in India (Sen, 1976), have already been emphasised. Demographic studies of Indian tribes have also been warranted for development purposes (Songh, B., and Reddy, K.N. 1982; Roy Burman, 1978).

Contrary to the above studies an attempt is made here to examine the population “Irulas of Nilgiris” in a different anthropological perspective. The exogamous cultural groups that are present in the endogamous population are considered as structural units for the biology of that population. The number of clans that are present, their size and distribution, mating behaviours, effective size, selection intensity, inbreeding levels, fertility and mortality trends are located.

## Materials and Methods

As per 2011 Census the Irulas are the second numerically largest tribe of Tamil Nadu, with a population of 89,025. They are largely distributed in seven districts namely, Chengleput, North Arcot, South Arcot, Tiruchirappalli, Salem, Coimbatore and Nilgiris. In Nilgiris, Irula is the largest tribe with a population of 6,567 (1971). They are found in the lower altitudes of Nilgiri plateau and in the northern slopes of Moyar valley. Of the four Taluks in the Nilgiri District they are found mainly in two Tahsils, namely, Kotagiri and Ooty; very few are found in Coonoor and none in the Gudalur Tahsil. This study was therefore confined to the Irulas of Kotagiri and Ooty Tahsils.

Field work was done for about two months between June and August, 2017 in Irula settlements (12 from Kotagiri and 6 from Ooty Tahsils) selected purposively as the Irula settlements are based on Kulam (clan) concentration. Data on all demogenetic factor were collected through interview schedules from a total of 840 couples of the selected Irula settlements.

## Results and Discussion

The population of Irulas of Nilgiris is clearly divided into several organised kulams (clans). Each kulam is an exogamous patrilineal descent group. In Nilgiris about eight kulams are found to be predominant, namely, Kalkatti, Kuppar, Sambar, Devnar, Pungar, Kurunagar, Koduvar and Peradar. Other kulams like Poriger, Vellama, Velligar, Vaniyar and Uppiligar are present in the Masinigudi area of Nilgiris. As these kulams are observed only in the contact zone between Tamil Nadu and Karnataka states they are not included in the present study. Kulams vary from one another in their size. The Kulams, Kalkatti, Kuppar, and Sambar are large in size and they together account for more than half of the total population. Besides, these three kulams are distributed uniformly in the study area. Kulam Pungar, on the other hand, is found only in Kunjapani area (Kollikarai, Kunjapani and Sambanarai), Kurunagar and Koduvar Kulams are distributed widely in the villages of Anaikatti, Siriyur, Kalampalyam and Hallimoyar, Devnar Kulam in the villages of Vagapani Sambanarai and Mettukkal and Peradar Kulam in the villages of Mettukkal, Godagur and Kambiyur. Such nature of distribution of kulams indicates territorial affiliations.

## Marriages

Marriages are regulated through what is termed in Irula language, kulam mure of more. One interesting feature noticed from the study is that the kulams, Kuppar, Kalkatti, and Sambar, can take mates from any other kulam except their own. Whereas, the rest of the kulams, like Devnar, Pungar, Kurunagar, Koduvar, and Peradar are consider themselves as brotherly kulams and so depend on Kuppar, Kalkatti and Sambar kulams for mates. Thus certain kulams have the privilege of taking mates in all kulams, while certain other kulams have restrictions in taking mates. This might influence the genetic structure of the population.

## Age and Sex Composition

The pyramid of the entire Irulas of Nilgiris shows the general tendency of becoming narrower as the age advances from the infancy to old age. This represents a characteristic tradition of a population. However, the pyramids of individual kulams of Irulas of Nilgiris, reflect different picture. The kulams Kalkatti and Kuppar show the generalised form of pyramids. The kulam Sambar shows the smaller base of the pyramid. This suggests the low birth rates and / or high infant mortality. The pyramid of the kulam Devnar has broad base followed by sharp decline in age-groups of 5-19. This suggests that there are more premature deaths, i.e., deaths before reproductive age, in this kulam. The other pyramids of the kulams, Kurunagar and Koduvar are within the purview of the characteristic. The pyramid of the kulam Pungar presents comparatively smaller base suggesting low birth rates and/or high infant mortality. The pyramid of the kulam Peradar exhibits considerable deviations from the traditional one. It has smaller base upto the age groups of 10-14 followed by rise in distribution of higher age-groups till 55-59 except in 35-39 and 40-44 age-groups. However, the distribution narrows considerably from the age-groups of 6-64. This suggests that the survival capacity of this kulam increases after attaining the reproductive age. Low fertility rate, high infant mortality, and premature deaths might be the main cause for smaller base of its pyramid.

## Sex Ratio

The sex ratio for the entire population is 106 males for 100 females (Table 1). Sex ratios in Kalkatti, Kuppar and Sambar Kulams are 110, 106 and 117 males respectively for 100 females as against 97, 102, 90, 101 and males for 100 females in kulams, Devnar Pungar, Kurunagar, Koduvar and Peradar respectively. This shows that the availability of males to females are more in the first group of kulams where as it is equal or low in the second group of kulams. The presence of only 97 and 90 males for 100 females in the Devnar and Kurunagar kulams, respectively may be due to sampling errors or the incidence of lower birth rate or higher death rate of males.

## Mating Types

Mating types among Irulas of Nilgiris in terms of their kulams the distribution of Irula women of various kulams in matching types with men. There is no random mating among Irulas of Nilgiris. No population, for that matter, is an ideally random mating group. As has been earlier stated, kulam plays an important role in the selection of mates among Irulas. Of the eight kulams only three Kulams namely Kalkatti, Kuppar and Sambar, can exchange mates with all kulams except their own whereas the remaining five cannot do so. However, out of 840 mating types surveyed, four matings are found among these five kulams. No mating is reported between these five kulams. No mating is reported between Peradar and Sambar Kulams, restricting the choice of mates for Peradar kulam to the remaining two kulams viz., Kalkatti and Kuppar, Kulams- Devnar, Kurunagar, Koduvar, and Pungar are expected to exchange mates with Kalkatti, Kuppar, and Sambar kulams only. As a result, these brotherly kulams have had established individual rapport with other three kulams by means of consanguineous matings. The percentage of consanguineous matings are more in these kulams than among the kulams Kalkatti, Kuppar and Sambar.

Finding a mate either at random or reference is easy for kulams of the former group and difficult for the rest of kulams because of their rigid practice of kulam Mure. May be due to this reason the individual growth of kulams is also subjected to same stresses. The growth of kulams depends on males only as females join the spouse's kulam after marriage. So culturally a particular kulam tends to dwindle down if females are more to male.

### **Consanguinity**

Consanguinity contributes to the breeding and genetic isolation within the population. The nature and incidence of genotypes carried by individuals and populations can be assessed through the study of consanguineous marriages because such matings facilitate the recessive genes to manifest their effect and the semi-dominant genes to increase their efforts by becoming homozygous. It reflects the way genes combine in successive generations. Such marriages are found to occur more frequently in some Southern States, while they are considered to be a taboo in some populations of Northern India. In Irulas of Nilgiris, consanguineous marriages are preferred. Out of total 840 marriages, 46% are consanguineous unions. The consanguineous: non sanguineous ratio is 84.62. Cross –cousin marriages are the most common form (42.38%) of consanguineous unions. Marriages with Mothers brother's daughter account for 28.33% of total unions and it closely conforms with Red's (1973) findings in South Indian populations. Uncle and niece marriages constitute only 3.45% among the Irulas.

The mean inbreeding coefficient (F) for the entire population is 0.031. The 'F' value is the highest for the combination of kulams Sambar / Devnar (0.057), followed by Kuppar / Pungar (0.049); Kuppar / Sambar (0.043); Kuppar / Devnar (0.041); Kalkatti / Kuppar (0.039); Kalkatti/Devnar (0.034); and Kuppar / Peradar (0.034). These values are higher than the average value for the population. In contrast, the 'F' values are lower than the average value for the population in the combination of kulams like Kalkatti / Sambar; Kalkatti / Kurunagar; Kalkatti / Pungar; Kalkatti / Koduvar; Kalkatti / Peradar; Kuppar / Krunagar; Kuppar/Koduvar; Sambar /Kurunagar; and Sambar/Pungar. The higher 'F' values between most of the kulams are due to the fact that the five brotherly kulams have to exchange, mates with only three remaining kulams viz., Kalkatti, Kuppar and Sambar leading to the formatting of strong mating association ultimately contributing to a high incidence of consanguineous marriages. Such details within the population may throw greater light on inbreeding levels and the genetic structure of the population.

### **Breeding Size, Aging Index, and Dependency Ratio**

Over one-third of the total individuals belong to pre-reproductive age with a slightly higher percent in males except in kulams Devnar, Kurunagar, Pungar, and Kodubvar. In the reproductive age-group (15-49 years). One-half of males and females contribute to the breeding size of the population. However, higher frequency of females than males is noticed in kulams Kurunagar, Pungar and Peradar, indicating the tendency of higher fertility in these kulams. Also attributors of sampling error cannot be ruled out. In all kulams and by putting all kulams together. Older males are higher than the post-reproductive females, except in kulams Kupper and Devnar where post-reproductive females are higher. Stockwell (1992) defined the index of aging as "the number of persons aged 65 and over, per 100 children under 15 years of Age." In this study 59 years has been taken as border line for post-reproductive age ignoring the fertility in males beyond

this age in order for the entire irulas Nilgiris is 29.59 and it is 32.55 for males and 26.45 for females. The index value is the highest (47.22) for Peradar kulam followed by Kalkatti (31.79) and Pungar (31.25), highest index values are found among both the sexes in these kulams. In contrast the koduvar kulam had shown the lowest index values (20.90) followed by the Devnar (27.38) and the Sambar (27.69) kulams. The same trend is seen between the sexes in these kulams. The other kulams fall in between these two extreme points. Thus the kulam peradar is represented by more old age people than young people. The kulam kouvar is comprised of young people.

The dependency ratio corresponding to the ratio of biologically non-reproductive (below 15 and above 49 years) to reproductive individuals (15-49 years) for the entire Nigiri Irula population is 82.38 (table 6) This, further reads that the producers are more than consumers. The dependency ratio is less in peradar kulam followed by Devnar, Kupper, Kalkatti, Sambar, Koduvar, Purgar and Kurunagar. The higher value for the kulam Kurunagar indicates that dependents are just equal to producers.

### **Effective Population size**

The effective population size is a measure of the reproductive potential of a population and is usually calculated based on reproductive inequalities in the population according to wright's formula (cl.sen, 1976). The effective population size for the entire Irulas of Nigiris is 1290 which is lower than the actual breeding size. This is largely due to greater variance of the number of children. This size is also smaller for all kulams except in Koduvar may be due to the smaller variance of the number of children per couple than the mean number of children. In kulams, Pungar, Peradar and Kurnagar, the effective population size is just lower than the actual breeding size.

### **Fertility and Mortality**

An analysis of the data collected on the number of children ever born in relation to the age-group of entire Irula women of Nilgiris. presented it is clear that 10.51% of total Irula women are not having any child at all; 17.43% have one child, 16.93% have two children, 16.19% have three children, 12.73% have four children, 10.63% have five children, and the remaining 15% have six or more children. Analysis of data across the age-groups of women shows that women in the age-groups of 20-29 and 45% (those who reached full reproductive life) have the largest number of children ever born, from this analysis it is found that the mean number of children ever born to a woman is 3.18. If we study this by age-group of women it is observed that the mean number of children ever born is highest in the age-groups 45 and it is 5.36. We may thus come to the conclusion that most of the irula women of Nigiris have 2 to 6 children ever born. The percentage distribution of entire Irula women by age and number of children dead. It is found that no children are dead for 63.78% of women, one child is dead for 18.29% of women, two children for 9.52% of women, three children for 4.08% of women, four children for 2.22% of women, and five or more children are dead for 2% of women, This analysis shows that there are about 30% of women to whom one or more children are dead. Analysing the data on the basis of age-group of women it is found that the mean number of children dead is highest in the age-group of 45, which is about 1.47% and it is below 1% in all other age-groups except

in 40.44, where it is 1.12%. This means that the mean number of children dead is considerably low in majority of the age-groups. The overall mean number of children dead is 0.7%.

## Conclusion

Anthropological demographic data on Irulas of Nilgiri's with special reference to their clan organisations present the following interesting interplay of biology and culture. The entire population, Irulas of Nilgiris, is enmeshed in exogamous units (clans), referred by Irulas their language as Kulams. There exists eight such clans (kulams) distributed in the core of Nilgiri hills. Kulams maintain territorial and mating affiliations. This brings genetic differentiation among them at kulam (clan) levels for all demographic features viz., age and sex composition, sex ratio, consanguinity, breeding size, aging index, dependency ratio, effective population size, selection intensity, and fertility and mortality. The present analyses indicate the need for further comparative studies at clan levels on specific populations of India. Further, the results emphasise the essential features of biological population in terms of clan structures and their associations with other clans for kin identities and mating purposes for tracking down its nature of biology. The growth or decline of individual clans in human groups depends on differential fertility and knowledge of reproductive capacity, fertility and mortality trends at clan level would help greatly in constructing the true demographic structure of the population.

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