

Incidence of Consanguinity and its Trend in a Mendelian Population of Kerala

M.V.Sudhakaran and B. Vijayavalli

Department of Botany, University of Kerala, Kariavattom, Thiruvananthapuram 695 581, Kerala, India

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ABSTRACT To determine the prevalence, pattern and trend of consanguinity an interview study was conducted (during 1993-1996) among the Pulayas of Alappuzha district of the state of Kerala. Of 601 marriages investigated 9.48% were consanguineous with an average coefficient of kinship of $\alpha=0.00599$. First cousin marriages were the most common (7.65%) with high incidence of Patrilineal cross cousin union (4.66%), followed by Second cousin (1.66%) and First cousin once removed (0.17%). Regional differences are conspicuous, rate of consanguinity was found to be lower for urban areas (6.56%) relative to those in rural areas (11.62%). A consistent declining trend in consanguinity over time was not evident in the community, suggests that their propensity to marry a relative has not changed much over time. Because such marriages are part of a deeply rooted cultural trait among them offering significant social and economic benefits.

INTRODUCTION

Marriage is a social contract between persons of opposite sex, within which love, sex and child bearing are legitimised and legalised. Through regulation of conjugal and filial ties each marriage link forming a component of a wider pattern of kinship. Obviously in no organised human society, sexual relationship unregulated by norms and left exclusively to individual preferences. Since ancient times ecclesiastic and secular authorities have prohibited closely related marriages. This was based on social mores for the formation of a society and civilisation which was inconceivable without an incest taboo (Mead, 1968). The pattern of marriage in India is regulated by three model practices namely, endogamy, exogamy and sapinda (Kapadia, 1982). The practice of sapinda regulation among the North Indian Hindus strictly forbids marriage between two individuals related by a male common ancestor upto five generations on paternal side and three generations on maternal side (Richard and Rao, 1994). But it is much relaxed in South India, where this sapinda

prohibition is opposed by prescribing or preferring certain types of consanguineous marriages. However, the precise consanguineal relationship that are viewed as incestuous vary from one society to another. Therefore, the rate of consanguinity vary through out the region (Sudhakaran, 1996).

Several theoretical and empirical studies on consanguinity have been reported from different human populations world over (Bemiss, 1858; Schull and Neel, 1972; Khat and Kuder, 1984; Shami et al., 1991). Sanghvi (1954) was the first to make a quantitative study on consanguineous marriages in India, followed by this several studies were carried out among various populations groups. Of these, the highest incidents of consanguinity were reported from south India, mostly from Andhra Pradesh, Karnataka and Tamil Nadu (Dronamraju and MeeraKhan, 1961; Centerwall and centerwall, 1966; Rao and Inbaraj, 1977; Richard and Rao, 1994). The report of such investigations from the population of Kerala are very few (Ali 1968; Chakravarti, 1968; Sudhakaran and Vijayavalli, 1996).

The present study aims to assess the frequency of consanguineous marriages, their pattern, relationship with region of residence and temporal trend in a Mendelian population, the Pulayas of Alappuzha district of the state of Kerala.

MATERIALS AND METHODS

The Pulayas, an endogamous Hindu population of Kerala presently included under the Scheduled Caste. They are in the lowest rungs of the Hindu caste system and are mainly agricultural labourers. Despite the constitutional provision for special privilege (as Scheduled Caste) and many welfare programmes implemented by the State and Central governments, vast bulk of the people of this community in the district

continues to remain in low state in their socio-economic and educational attainments. The information on marriages from 601 couples have been collected randomly from the rural, urban and sub-urban regions of the district, by door to door survey (during 1993-1996) and interview method using a comprehensive questionnaire. When a marriage was reported as consanguineous a pedigree was drawn and type of consanguinity determined. The frequency of consanguinity, their patterns and relationship with region of residence were also determined. The temporal trend of consanguinity was evaluated based on the year of marriage of the spouses. Marriage

first cousin once removed (0.0313) observed albeit with very low frequencies 0.17%. No uncle-niece/aunt-nephew ($F=0.125$) marriage was noticed. The observance of the reason for consanguineous marriages demonstrate that, in all cases the maintenance of family property was the major consideration, joint family system, maternal link and reduced dowry payments were other motivating factors.

The region-wise analysis showed that the consanguinity rate was low in the sub-urban (6.35%) areas, intermediate (6.56%) in urban and high (11.62%) in rural areas, corresponding differences were noticed in their mean coefficient

Table 1: The frequency distribution of consanguinity by type and region of residence among the Pulayals of Alappuzha

Type of marriage	Urban		Sub-urban		Rural		Total	
	n	%	n	%	n	%	n	%
First cousin	8	6.56	5	3.97	35	9.35	46	7.65
Patrilateral cross cousin	4	3.28	2	1.59	22	6.23	28	4.66
Matrilateral cross cousin	4	3.28	3	2.38	11	3.12	18	2.98
First cousin once removed	-	-	1	0.79	-	-	1	0.17
Second cousin	-	-	2	1.59	8	2.27	10	1.66
Total	8	6.56	8	6.35	41	11.62	57	9.48
Nonconsanguineous	114	93.44	118	93.65	312	88.38	544	90.52
All marriages	122		126		353		601	
Mean coefficient of inbreeding	0.00413		0.00371		0.00728		0.00599	

prior to and during 1954 were put into one group and marriage thereafter were grouped in ten years duration. Nonconsanguineous families from the same socioeconomic status of the community were taken as control. Chi-square tests have been used to test the significance of the differences between the proportion. The mean coefficient of inbreeding for the population was calculated by Sewall Wright's formula (1922).

RESULTS

The percentages and frequencies of various types of consanguineous marriages, their relationship with region of residence along with average inbreeding coefficients are presented in table 1. Of the 601 marriages investigated 9.48% were consanguineous with average coefficient of kinship for the population of $\alpha = 0.00599$. First cousin marriages ($F = 0.0625$) were the most common type (7.65%) with patrilateral cross cousin (PPC) union was predominant type. Second cousin union ($F = 0.0156$) with 1.66%,

of inbreeding also. However, consanguinity in relation to the region of residence was found to be statistically not significant ($0.20 > p > 0.10$). Since consanguineous classification referred

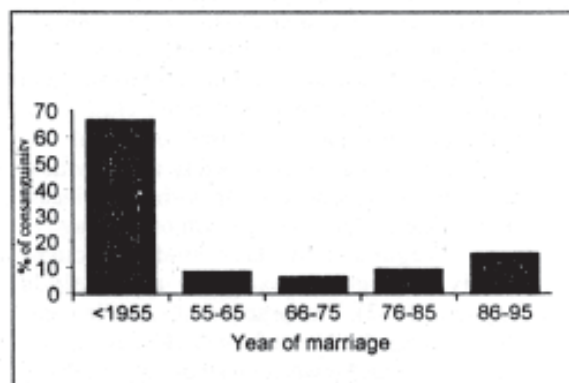


Fig.1. Temporal trend of consanguinity among the Pulayals

here only to the present generation more distant common ancestors than great grand parents were not considered. Hence the average coefficient of inbreeding calculated for each locality represent the minimum inbreeding estimates for the community. The temporal trend of consanguinity are presented in figure. 1. For the period covering 1954 and earlier showed highest consanguinity (66.66%), and lowest during 1965-1975. Obvious declining trend of consanguinity was noticed from 1955 to 1975 later period showed increase in the rate from 6.38% to 9.25% during 1976-1985 and upto 15.12% during 1986-1995 (Fig. 1). Relatively high incidence of consanguinity noticed before 1955 periods may be due to small sample size of the population studied. The overall chi-square value obtained for the sample was estimated to be $p < 0.001$.

DISCUSSION

Random mating or panmixis is very often a convenient theoretical assumption in man. Obviously, in no human population mating is random in the classical sense, because of the finite population size, ecological preferences, socio-economic biases and behavioural characteristics of the mating groups, where preferential matings between relatives is a common practice. Consanguinity is a central feature of family systems and kinship organisation in many parts of the world, including South India, most countries in Middle East, South Asia, some countries in Sub-Saharan Africa, Middle Asian republic of Soviet Unions and China, where marriage between close biological relatives account for 20-55% of all unions (Bittles et al., 1991).

In the present study consanguinity accounts for 9.48% of all marriages with an equivalent mean coefficient of inbreeding of $\alpha = 0.00599$. Of these, the most encountered are first cousin marriages with PCC, that are preferred to MCC. A plausible explanation for this situation is that the mother's brother's daughter's (MCC) of suitable marriageable age might not be available for every boy or the available girl might not be a suitable match for an educated boy or vice versa owing to the restricted population distribution of these people in Alappuzha. The studies reviewing the incidence of consanguinity in South India show that the rate of consanguinity varies

through out the region. Average total values ranges from 30-60% with an equivalent mean coefficient of inbreeding of $\alpha = 0.0267$ to 0.0493 (Rao and Inbaraj, 1977; Reddy and Rao, 1978; Bittles, 1980; Roychoudhury, 1980). These estimates are virtually many times higher than the estimates obtained for consanguineous marriages in Kerala (Ali, 1968; Roychoudhury, 1980; Sudhakaran and Vijayavalli, 1996; 1997), including the present study. A plausible explanation for low incidence of consanguinity in the population groups of Kerala, may be due to high literacy rate and absence of uncle-niece marriages, the latter being predominant in other South Indian States.

The relationship between consanguinity and region of residence shows that the incidence of consanguinity is lower for couples in urban areas (6.56%) relative to those in rural areas (11.62%), which appears to be the general trend consistently reported (Centerwall et al., 1969; Rao and Inbaraj, 1977; Saedi-Wong et al., 1989; Bittles, 1994; Richard and Rao, 1994). A consistent declining trend in consanguinity from older to younger generation was not evident in the present study (Fig 1). Which is uniquely contrasted with the decline in inbreeding in most areas of the world (Coleman, 1980; Label 1983; Imaizumi, 1986; Bittles, 1994), and in South India (Chandrasekar et al., 1993; Richard and Rao, 1994). It suggests that the propensity to marry a relative has not changed much over time in this community, because such marriages are part of a deeply rooted cultural trait among the offering significant social and economic advantages.

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