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GENETICAL DEMOGRAPHY
OF APATANIS

ABSTRACT — This paper discuss the genetical demography of Apatanis, who inhabit Lower Subansiri district of Arunachal Pradesh. Their population, according to 1971 census was 12,488 individuals. In consequence of their breeding structure Apatani society is divided into two hierarchical and endogamous groups, namely Guth and Guchi. 374 Guth and 190 Guchi households were studied for the present investigation. Apatanis practice child marriages. Mean No. of live births per Guth married woman is 4.58; whereas Guchi married woman has 4.41 live-born children. The percentage of children survived in case of Guth were 73.32 and 73.84 in the case of Guchi. Live born children per woman of completed fertility were 5.43 (Guth) and 5.81 (Guchi). Child-woman Ratio for Guth and Guchi are 1,119 and 1,219 respectively. The Net Reproductive Index (NRI) computed is 1.73 and 1.66 in that order. The selection Intensity is 0.8896 and 0.7088 for Guth and Guchi respectively.

KEY WORDS: Apatani — Guth — Guchi — Arunachal Pradesh — Reproductive Life.

INTRODUCTION

Human Evolution is a result of interaction of biological and social variables. The processes that affect cumulatively to bring in the changes in gene frequencies of succeeding generations are mutation, selection, genetic drift and social regulation of marriage (Dobzhansky, 1976).

Evolution can be viewed at macro or micro-levels. For micro-evolution, population is the unit of observation and demography can be used as a tool to discern the possible changes in the next generations. Its emphasis is laid on population breeding structure and its size rather than on its structure. This is generally referred as genetical demography. Here, selection is measured through generations by the probable survival of offspring per individual.

India, a myriad of populations living in different eco-systems, pursuing diverse modes of life conditioned by diverse socio-cultural systems provides ample opportunities for investigations in genetical demography. Nevertheless, only a few studies (Basu, 1969; Basu, 1972; Talukdar, 1979 etc;) were undertaken. Paucity of information of this nature has led us to undertake a detailed bio-anthropological investigations amongst the Apatani of Arunachal Pradesh. The present paper discusses the genetical demography of Apatanis.

Apatanis are confined to a plateau of 21 sq. km in the lower Subansiri District which lies in the lattitudes 26°55′ N and 28°42' N and longitudes 92°41′ E and 94°37′ E of Arunachal Pradesh. Apatani Plateau is on an elevation of 1,524 metres. Christoph von Furer Haimendorf was the first to enter the plateau in 1944. He has recorded his observations in a series of books and articles from 1955 to 1980. As of now there are 8 main villages and 14 village extensions/hamlets which are populated by Apatanis whose number is about 12,488 individuals (Males 6,470 and Females 6,418) according to the 1971 census. Lately many Apatanis left their plateau on business interests or for jobs to other parts of the state and the country.

Apatanis are Indo-Mongoloids with medium height and yellowish complexion. They are believed to have come to their present habitat from far-east, exact date or route of their migration still shrouds under confusion and speculation. Their language with no script resembles to that of the Adis. Apatanis are permanent wet-rice cultivators unlike most of the other tribes in north-east India who still practice slash and burn cultivation. Their economy is self sufficient.

Apatani society has been divided into two main groups Guth and Guchi; there is also a third group called Kumr with two families. Guth claim a higher social status over Guchi by virtue of their birth. Apatani tradition dictates marital seggregation and ritual isolation during the 'Mloko' festivities between Guth and Guchi. Except this, there is no barrier between the two groups either in social interaction or at interpersonal and inter-familial level. Haimendorf (1951 and 1980) notes that there exists pre-marital sexual relationships between Guth and Guchi, but also points out that these relationships never lead to marital union or to bearing children. In the course of our study we could only note that three Guth and two Guchi males have taken their spouses from the other group; besides this, one male and one female Guchi have married non-Apatanis. Apatani society ostracizes its members who violate the rule of group endogamy to Guchi status. This fact has made us to treat the Apatanis as two Mendelian populations or genetic isolates.

MATERIALS AND METHODS

The data for the present study has been collected from 6 villages of the Apatani Plateau namely Michi-Bamin, Hija, Ziro, Lempiya, Reru and Tajang from December 1981 to February 1982. Information was collected from 374 Guth and 190 Guchi couples on marriage and reproductive life. Information includes names of the spouses, their pre and post-marital places of residence, clans, ages, ages at marriage, number of times married and the fate of multiple marriages. Information sought on the reproductive life include the age, sex and number of everborn children, living and dead children, if dead the age at death, still-births and abortion. Finally a family pedigree was drawn. Information was collected mainly through personal interviews with the spouses of the family. Problems

in estimating the ages of Apatanis were the same as with any other pre-literate population. But the recorded ages are correct almost to the year due to the synchronization of important remembered events like Haimendorf's visit to the Plateau, establishment of Ziro township and Chineese War etc., with the birth and death of individuals. Every care was taken to crosscheck and eliminate the data which proved incorrect or doubtful.

RESULTS

Marriage: Marriage is the most formidable barrier which seperates Guth from Guchi. Tribal and sub-group endogamy, clan or sub-clan exogamy (in case a clan becomes large in numbers) are strictly followed. No consanguinity is allowed. Child-marriages are common — 30.31% Guth and 16.22% Guchi marriages were solemnised when the spouses were children. However, this practice is slowly abandoned due to the pressure of modern reform movements. Age at marriage (adult) is considerably higher; Guth males marry at a late age compared with Guchi males, there is no significant difference amongst the Guth and Guchi females. Mean age at marriage for males is 21.12 ± 4.28 years (Guth) and 19.66 ± 3.04 years (Guchi) and for females it is 16.62 ± 3.01 (Guth) and 16.49 ± 2.83 years (Guchi). Village endogamy is preferred. Mean marriage distances for Guth and Guchi are 0.61 km and 1.22 km respectively. Village endogamy, uneven representation of Guchi households and limited territory of the Plateau are the factors for this short marriage distances. Remarriage after divorce or widowhood is quite common — 126 Guth and 56 Guchi were recorded as married more than once. 12 Guth and 8 Guchi males were bigamous.

Reproductive life: Age at menarche for Apatanis is 13.4 ± 0.88 years (Sakhrie, 1982). Of the 374 Guth and 190 Guchi married women 24 women in the former and 9 in the later groups have had no pregnancy. However, most of these infertile women were in the reproductive age groups; only 6 Guth and 1 Guchi women were infertile even beyond 45 years of age. Tables 1—5 represent the detailed fertility patterns among the Guth and Guchis.

There were a total of 1,802 pregnancies for Guth mothers and 854 pregnancies for Guchi mothers of whom 4.99% in the former and 1.99% in the latter

groups were reproductive wastage. Of them 70.03% pregnancies for Guth mothers and 71.9% for Guchi mothers have survived. The live born children, surviving children, dead children, still born and aborted foetuses per mother are 4.89 (Guth), 4.62 (Guchi); 3.61 (Guth), 3.41 (Guchi); 1.29 (Guth), 1.21 (Guchi); 0.11 (Guth), 0.15 (Guchi) and 0.07 (Guth), 0.03 (Guchi) in that order.

Age wise fertility rates show an upward tendency of higher fertility towards the higher age groups up to the 40—44 age group but it decreases from 6.03 to 5.43 in the succeeding age group of 45+ amongst the Guth.

There were 114 Guth and 63 Guchi mothers in our sample who have completed their reproductive life. The survival rate of the children of the mothers of completed fertility is much less in comparison to the mothers of all ages. In the case of Guth only 66.56% and in respect to Guchi only 66.61% of children have survived. The mean number of children per married woman are 5.43 (Guth) and 5.81 (Guchi), but the mean numbers of surviving children are 3.62 (Guth) and 3.88 (Guchi). Of the 5.72 (Guth) and 5.91 (Guchi) children per mother, 3.81 (Guth) and 3.94 (Guchi) have survived.

The Child-Woman ratios are 1,119 (Guth) and 1,219 (Guchi). Net Reproductive Index computed for Guth and Guchi are 1.73 and 1.66 respectively. The Index of opportunity for selection was calculated after Crow (1958), and dealt elsewhere separately. The I value for Guth is 0.8896 and for Guchi 0.7088 (Padmanabham, 1984).

DISCUSSION

Marital isolation between Guth and Guchi divides Apatani society into exclusive isolates. This study along with Pahira, and Naika if taken together, clearly indicates that the tribal groups are not homogeneous and are as segmentary as the caste Indian populations are. More studies of this nature would enable us to evaluate the nature of the tribal groups.

Apatanis are the only tribal group reported so far who practice child marriages. However, latest

TABLE 1. *Birth Record*

| | No. of mothers | Total births | No. of births per mother | Surviving children | | | Dead children | | | Stillbirths | | Abortion | |
				Sibs surviving	Percentage	Surviving sibs per mother	Sibs dead	Percentage	Dead children per mother	Stillbirths	Stillbirths per mother	Abortions	Abortion per mother
Guth	350	1,712	5.00	1,262	73.72	3.61	450	26.28	1.29	39	0.11	51	.15
Guchi	181	832	4.69	618	73.84	3.41	219	26.16	1.21	12	0.07	5	.03

TABLE 2. *Age-wise Birth Rates*

| Age Group | Guth | | | Guchi | | |
	No. of ever-married women	No. of live births	No. of live births per-ever married women	No. of ever-married women	No. of live births	No. of live births per ever-married woman
15—19	18	13	0.72	13	17	1.31
20—24	36	55	1.52	26	52	2.00
25—29	43	130	3.02	24	85	3.54
30—34	31	132	4.26	19	75	3.85
35—39	65	362	5.57	27	141	5.22
40—44	61	368	6.13	17	95	5.59
45+	120	652	5.43	64	372	5.81
Total	374	1,712	4.58	190	847	4.41

TABLE 3. *Surviving Sibship Size by Ever-Married Women and Women Above 45 Years of Age*

| No. of surviving children | No. of ever-married women | | No. of women above 45 years of age | |
	Guth	Guchi	Guth	Guchi
0	24	9	6	1
1	43	18	6	2
2	41	26	8	5
3	37	26	8	4
4	40	23	14	6
5	51	24	17	9
6	33	26	18	15
7	43	11	18	6
8	29	8	10	3
9	11	12	4	8
10	13	5	7	4
11	7	2	3	1
12	2	—	1	—

TABLE 4. *Completed Family Size of the Woman Above the Age of 45 Years*

| | No. of married women | No. of mothers | No. of infertile women | Live born children | | | | | | |
				Surviving	Dead	Total	Mean No. of livebirths per married woman	Mean No. of surviving children per married woman	Mean No. of livebriths per mother	Mean No. of surviving children per mother
Guth	120	114	6	434	218	652	5.43	3.62	5.72	3.81
Guchi	64	63	1	248	124	372	5.81	3.88	5.91	3.94

TABLE 5. *Number of Children Born per Mother of completed Fertility in Some Indian Populations*

Population	Area	No. of mothers	Children/mother	Reference
Kayastha	West Bengal	20	8.7	Sen, 1953
Vaidya	West Bengal	58	7.98	Sen, 1953
Brahmin	West Bengal	21	6.71	Sen, 1953
Hajong	Meghalaya	31	6.8	Barua, 1983
Irula	Tamil Nadu	37	6.55	Basu, 1967
N. Pahira	West Bengal	9	6.44	Basu, 1969
Bhoksa	Uttar Pradesh	30	6.40	Garg et al. 1981
S. Pahira I	West Bengal	16	6.38	Basu, 1969
S. Pahira II	West Bengal	11	6.18	Basu, 1969
Santhal	Bihar	10	6.1	Sarkar, 1944
Apatani (Guchi)	Arunachal Pradesh	63	5.91	Present Study
Naika (Rural)	Gujarat	50	5.82	Padmanabham, 1984
Maler	Bihar	10	5.8	Sarkar, 1944
Chenchu	Andhra Pradesh	53	5.75	Sirajuddin, 1984
Apatani (Guth)	Arunachal Pradesh	114	5.72	Present Study
Non-Christian Khasi	Assam	33	5.71	Nag, 1965
Punjabi Sonar	Meghalaya	13	5.69	Jaswal et al. 1984
Singpho	Arunachal Pradesh	128	5.58	Padmanabham, 1981
Vokkaliga	Mysore		5.46	Das, 1978
Dhurwa	Madhya Pradesh	54	5.17	Rakshit, 1972
Dorla	Madhya Pradesh	43	4.86	Rakshit, 1972
Kanikkar	Kerala	31	4.74	Nag, 1954
Naika (Urban)	Gujarat	84	4.63	Padmanabham, 1984
Kond	Orissa	31	4.61	Devi, 1975
Dule Bagdi (12 village)	West Bengal	191	4.2	Talukdar, 1979
Christian Khasi	Assam	42	4.1	Nag. 1965
Kota	Tamil Nadu		4.1	Basu, 1972
Dule Bagdi (9 village)	West Bengal	79	3.9	Talukdar, 1979
Onge	Andamans	2	2.37	Malhotra, 1984
Great Andamanese	Andamans	8	1.33	Malhotra, 1984

social forces discourage this practice and they are being slowly abandoned. However, the age at marriage (adult) is slightly higher, when compared with other pre-literate populations. The average number of children born per Apatani mother both among the Guth and Guchi groups is fairly high. However, Guth mothers of completed fertility have lesser number of live born children than caste groups like Kayastha, Vaidya and Brahmin (Sen, 1953), tribal groups like Hajong (Barua, 1983), Irula (Basu, 1967), Pahira (Basu, 1969), Bhoksa (Garg et al. 1981), Santhal (Sarkar, 1944), Rural Naika (Padmanabham, 1984a) Maler (Sarkar, 1944) and Chenchu (Sirajuddin, 1984). Guchi mothers have more children than Chenchu, Maler, and Rural Naika (Table No. 5). The reproductive wastage for Apatani especially, in the case of Guth is very high. The Net Reproductive Index as well as Child-Woman Ratio for the two groups is very high indicating better fertility prospects for the future.

Selection Intensity for both Guth and Guchi is on the higher rungs of the scale especially in case of Guth. The value for Guth stands in the middle position between tribal groups, whereas Guchi falls in the range of agricultural and caste populations (Padmanabham, 1984).

In the final analysis, it seems that though Apatanis are divided into separate genetic isolates, there is no significant difference between the two groups except at a marginal level. However, as the admixture is very low, the separate existence of the two groups is not threatened and differences on a significant scale may appear in other genetic measures.

The fertility patterns amongst the different populations reported so far would not allow us to classify them into categories of caste and tribal populations. In all around 30 populations have so far been covered, initially caste populations were given importance, but later on emphasis has been shifted to tribal populations. The caste groups like Kayastha, Brahmin and Vaidya were studied more than a generation apart from now. And on the basis of that we cannot conclude that caste populatins have higher number of children than tribes. More over regional factors has to be taken into consideration, for castes differ significantly in every respect from one area to another. So, the views of Garg et al. (1981) that caste populations have more children than tribals is not tenable. The authors' view is further corroborated by Nag (1976) who finds no significant difference between castes and tribals as far as fertility is concerned. Kunbi (Sahu, 1978), Parsi (Karkal, 1982) and Naika (Padmanabham, 1984a), show newly emerging trends due to the voluntary and governmental efforts to reduce the number of children per family. Most probably the new emerging trends have wider acceptance in the caste populations rather than in the tribal ones.

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