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BRIEF COMMUNICATIONS

Opportunity of Selection in the Khamti of Lakhimpur District, Assam, India

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ABSTRACT In the present communication an attempt has been made to measure the Index of Opportunity for selection in the Khamti, a migrant, endogamous, community of Narayanpur, Bihpuria areas in Lakhimpur district, Assam, based on data on pregnancy outcome of 29 Khamti ever-pregnant women aged 45 + years. The results of the present work were compared with those of the available data on the tribal populations of North Eastern India. It is observed from the present analysis that childhood death and embryonic death are very low but mean offspring size is high. The value of I and its mortality and fertility components are also low. It is evident that selection is operating with low intensity in the Khamti of Lakhimpur district, Assam and the average general fitness of the population is high.

INTRODUCTION

Differential fertility and differential mortality are two major forces of natural selection responsible for change in the gene frequencies in a population and selection intensity is the measure of fitness of a population as expressed by the ongoing patterns of differential fertility and differential mortality, combined in a particular manner. The index of opportunity for selection measures the maximum potential rate of change by selection where 'Zero' indicates no change (Livingston and Spuhler, 1965). Crow (1958) formulated an indirect method for computing the index of total selection based on the maximum amount of differential fertility and differential mortality in a population, which was renamed as index of opportunity of selection (Crow, 1966) and was corrected by Johnston and Kensinger (1971) incorporating the embryonic mortality component.

The major components of natural selection *(i.e.* differential fertility and differential mortality) vary not only due to bio-genetic factors but also due to socio-cultural, religious, ethnic and environmental factors. In a recent review report on Indian works, variation between rural and urban groups, socio- economically backward and advanced groups was reported (Reddy and Chopra, 1990). An endeavour has been made in the present report to measure the opportunity of natural selection among the Khamti of Narayanpur, Bihpuria areas in Lakhimpur district, Assam.

The Khamti, spelt as 'Hkamti' or 'Khampti', belong to the great Shan (Tai) group of upper Burma and migrated to Assam in the 2nd half of 18th century and settled near the Tengapani river south of Sadiya, with the sanction of the ruling Ahom authorities during the reign of Gaurinathasimha (A.D. 1780-1790). They captured Sadiya, ousting the then Ahom Governor and gained the recognition of the Ahom and subsequently of the British Government. In 1839 A.D. the Khamti rebelled against the British. Being defeated by the British they took shelter in the surrounding forests and hills for a few years. Subsequently a large number of Khamti people returned to Burma and those who stayed behind were divided into four groups and eventually were allowed to settle

at different parts of the then Lakhimpur district of Assam in 1943 (Gogoi, 1971). Two Khamti settlements near Sadiya came under the jurisdiction of present Lohit district in Arunachal Pradesh, while the remaining two at Narayanpur, Bihpuria areas came under the jurisdiction of present day Lakhimpur district in Assam after reorganisation of the latter.

As per 1981 census (Singh, 1990) the total Khamti population in Arunachal Pradesh was 6,181 individuals. The Khamti of Arunachal Pradesh claim higher social status and distinguish themselves clearly from their counterparts in Assam.

The Khamti of Assam are Buddhists by religion and practise wet paddy cultivation. They retained their traditional culture and language which are quite similar to those of their counter-parts in Arunachal Pradesh. They have adopted some cultural traits of the neighbouring Assamese caste populations. They follow clan exogamy but community endogamy. They are separated geographically from their counterparts in Arunachal Pradesh by 280 km since their separation in 1843.

MATERIAL AND METHODS

The present communication is based on demographic data collected from all the 63 Khmati households residing in six neighboring villages *i.e.* Borkhamti, Borpathar, Gosaibari, Sribhuyan, Deotala and Tipling, situated within a radious of 4-5 km at Narayanpur, Bihpuria areas of Lakhimpur district, Assam, following indepth interview and pedigrees, emphasising on fertility and mortality by house-to-house visit in the month of May, 1992. The ages of the subjects were recorded following horoscope, school certificate, as available, and also by correlating with certain local events where no record was available. As per our census survey, the total Khamti population in Lakhimpur district, Assam was 450 individuals comprising 219 males and 231 females. For the present report, fertility of women aged 45+ years was taken into account. The index of opportunity of selection (I) and its mortality and fertility components (I_m, I_f) were computed following the original formula of Crow (1958), as well as modified version of Johnston and Kensinger (1971) as follows :

Original formula :

$$I_t = I_m + I_f$$

Modified version :

$$I_t = I_{me} + I_{mc} + I_f$$

Where,

I_t = Index of opportunity for total selection per generation

I_f = Index of fertility = Variance in the number of live births (V_f) / Square of the mean live births ($\overline{X}^2$)

$= V_f / \overline{X}^2$

$I_m = I_{mc}$ = Proportion of pre-reproductive deaths, *i.e.* deaths before 15 years of age (P_d) / Proportion of survivors upto 15 years of age (P_s)

$$= \frac{P_d}{P_s}$$

I_{me} = Proportion of embryonic deaths (P_{ed}) / Proportion of survivors upto birth (P_b)

$$= \frac{P_{ed}}{P_b}$$

RESULTS AND DISCUSSION

The values used in computing selection potentials are as in table 1 which reveals that the proportion of survivors upto birth (P_b = 0.995) among the Khamti of Assam is very high and the proportion of childhood death, *i.e.* death before 15 years of age (P_{cd} = 0.152) and that of embryonic death (P_{ed} = 0.005) are very low. The mean number of live births per woman aged 45 + years ($\overline{X}$ = 7.621) is high enough. The value of I is 0.321 as computed following the original formula (Crow, 1958) and it is 0.319 when embryonic mortality was considered as per modified method (Johnston and Kensinger, 1971). The results of the present study were compared with those of available published data on North Eastern India's tribal communities having comparatively larger

Table 1 : Values used in computing selection potentials

Number of married women aged 45 + years=	29
Number of reported pregnancies=	434
Number of live births=	434
Number of childhood deaths (deaths before 15 years of age)=	66
Number of embryonic deaths (abortions + still births)=	2
Proportion of survivors upto birth (P_b)=	0.995
Proportion of survivors, early embryonic stage to 15 years of age ($P_b P_a$)=	0.844
Proportion of childhood deaths ($P_{od} = P_d$)=	0.152
Proportion of embryonic deaths (P_{e})=	0.005
Mean number of live births per woman aged 45 + years (X)=	7.621
Variance of fertility (V_f)=	6.579

population than the Khamti of Assam (Table 2). It is evident that present findings are in conformity with those on the Sonowal Kachari of Assam (Deka, 1978) but much lower than other tribal communities of North Eastern India, it is also observed that the mortality and fertility components and mean offspring number are more or less similar in Khamti and Sonowal Kachari of Assam. For other tribal communities of North Eastern India, the mortality component is much higher than that for Khamti and Sonowal Kachari. It is apparent that low mortality component (I_m) and socio-economic factors may be responsible for low magnitude of total selection intensity. Socio-economic factors affect the index of opportunity for selection (Spuhler, 1963 and others). It is also found that the magnitude of I among the Khamti of Assam is closer to the lower level of the range (0.258 - 2.250) of the Indian populations (Reddy and Chopra, 1990). As per Haldane (1949) "The fitness of a genotype in the Darwinian sense is measured by the mean number of its progeny" (*cf.* Li, 1961). It is apparent from the above that the selection is operating with low intensity among the Khamti of Assam and the average general fitness of the population is high.

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Table 2 : Indices of opportunity for natural selection for the tribal populations of North Eastern India

Population	*Location*	*X*	V_f	*Crow 1958*			*Johnston & Kensinger 1971*				*Source*
				I_m	I_f	I	I_{me}	I_{mc}	I_f	I	
Khamti	Assam	7.621	6.579	0.179	0.113	0.312	0.005	0.179	0.113	0.319	Present study
Sonowal Kachari	Assam	7.040	6.990	0.192	0.141	0.360	—	—	—	—	Deka, 1978
Pnar	Meghalaya	6.972	6.499	0.236	0.134	0.401	0.202	0.236	0.134	0.681	Khongsdier, 1990
Hajong	Meghalaya	6.040	4.779	0.443	0.131	0.631	0.032	0.443	0.131	0.684	Barua, 1983
Jaintia	Meghalaya	8.103	8.180	0.456	0.125	0.638	0.107	0.456	0.125	0.814	Deka, 1989
Apatani Guchi	Arunachal Pradesh	5.810	6.430	0.435	0.190	0.710	—	—	—	—	Padmanbham, 1982
Apatani Guth	Arunachal Pradesh	5.430	9.210	0.440	0.312	0.889	—	—	—	—	Padmanbham, 1982
Singapos	Arunachal Pradesh	5.170	10.80	0.437	0.406	1.020	—	—	—	—	Padmanbham, 1981
Gallong	Arunachal Pradesh	6.700	8.200	0.750	0.180	1.070	—	—	—	—	Chakrabarty & Ahmad, 1989

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