Opportunity for Natural Selection among the Dibongiya Deori of Assam

***Juri Borah**
****S. Sengupta**

Abstract

The opportunity for natural selection in human population has been widely used to study variations among population groups inhabiting diverse bio-cultural environments. The present paper seeks to highlight the total selection intensity among the Dibongiya Deori of Assam. A comparison of the present data with that of the other available information on the population groups of Assam reported so far is also attempted.

Key words : *Reproductive Wastage. Pre-reproductive Mortality Selection Intensity. Dibongiya Deori. Assam*

Introduction :

Natural selection operates as a principal force of evolution. Differential fertility and mortality are the fundamental events of the natural selection and the major evolutionary forces which help to measure the fitness of a population in a particular environment. By the word 'fitness' Spuhlar spoke about the reproductive capacities of an individual or a class of individual in terms of number of offspring they contribute to the next generation (Spuhlar, 1973). The total potential opportunity for genetic selection in human population and its components due to fertility and mortality had been widely used to study variations among population groups or sub groups inhabiting diverse physical and socio-cultural environments (Spuhlar 1962, Morton, 1970).

The index of total selection intensity proposed by Crow (1958) combines both vital-statistics components and allows estimating the intensity of selection by differential mortality and differential fertility. The first component of Crow's index takes into

* Research Scholar of Anthropology, Dibrugarh University, Dibrugarh.
** Professor of Anthropology, Dibrugarh University, Dibrugarh.

account only the mortality of individuals who do not reached sexual maturity, and determines the proportion of children who failed to live to reproductive age to those who attained it. The other component takes into account the opportunity for natural selection due to differential fertility and is estimated by the ratio of the variance of the number of children in complete families to the square mean of the number of children in those families. Later, the original Crow's index has seen some modification. Since it covered mortality at postnatal age only, Johnston and Kensinger (1971) improvised the index by incorporating embryonic mortality to measure the maximum potential rate in a population.

Objectives :

Although various works concerning selection intensity have been carried out in India, studies on opportunity for natural selection on North East Indian population has not been received due consideration. The present micro level study was conducted among the Dibongiya Deori population of Lakhimpur district, Assam. The present paper aimed to estimate the intensity of selection in terms of Crow's (1958) as well as Johnston and Kensinger's (1971) indices. The results were discussed in the light of earlier studies on some population groups of Assam.

Materials and Method :

For the present analysis, the demographic data on reproductive histories of 55 Deori women of Majorchapori Deori village of Lakhimpr district were collected analyzed. The data were collected from the women with aged 40 years and above. The demographic information pertaining to fertility and mortality was obtained through personnel interview by specially designed schedule method. In the present study, indices of selection intensity indices were estimated by using both original formula of Crow (1958) and modified formula of Johnston and Kensinger (1971). Women whose husbands are alive and has given birth at least one child are only interviewed. The present study reported only about the cases of spontaneous abortion.

The Dibongiya Deori is a sub-division or territorial group of Deori, a scheduled tribe in the plain districts of Assam. The name of the tribe owes its origin from the river Dibang of their original homeland Sadiya in Arunachal Pradesh. They are mainly concentrated in Lakhimpur, Dhemaji, Jorhat, Golaghat, Sibsagar, Dibrugarh and Tinsukia districts of upper Assam. The Dibongiya section only preserved their traditional dialect

and at present they are bilingual. They are Mongoloid population with a strong religious believes. Agriculture is the main source of their livelihood.

Results and Discussion :

Demographic variables used in calculating selection potential are given in Table 1. Among Dibongiya, the mean number of live birth per mother aged 40 years and above is 4.09 + 0.55 with a variance of 3.64, whereas the frequency of premature death (died before 15 years of age) is 0.0844.

In the present study, the index according to improvised method shows considerable higher values than that of the values obtained by the original one mainly due to the inclusion of contribution of reproductive wastages. It is apparent that among Dibongiya population, opportunity for selection operates primarily through differential fertility, which may attribute to comparatively improved and easily accessible health care facilities. The low contribution of mortality component towards total selection intensity in this population signifies their relatively higher social status and economically better position than the other neighbouring population groups of the region.

Studies conducted earlier among different population groups of Assam reveals that the mortality component of selection is comparatively higher than its fertility component among the Sonowal Kachari, Khamti and Semsa population, while it is just reverse in case of the Ahom, Boro Kachari and Pnar Khasi population groups reported from Assam.

In Assam, the Semsa (0.677) has the highest value of 'I' which is closely followed by the Sonowal Kachari (0.541). Khongsdier (2003) while reviewing different degrees of the intensity of opportunity for natural selection in North East Indian population, has arbitrarily categorized them as low = < 0.340; moderate = 0.340 – 0.470; mild = 0.470 to 0.600; average = 0.600 to 0.730; high = 0.730 to 0.860; and very high = > 0.860. In the present study, the value of 'I' is found to be operating moderately than many other population groups reported from North East India. In Indian context the value is however, more towards the lower level of the range displayed by the Indian populations (Reddy and Chopra, 1990) following Crow's original (1958) method.

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Table-1

Demographic Variables used in Calculating Selection Potential

Parameters	DIBONGIYADEORI
Number of mothers aged 40 years and above.	55
Number of pregnancies	236
Number of live births	225*
Number of embryonic deaths	12
Proportion of embryonic deaths	0.0508
Number of dead children up to 15 years of age.	19
Proportion of child deaths up to 15 years of age	0.0844
Survivors up to 15 years of age and above	206
Proportion of survivors up to 15 years of age and above	0.9156
Number of live births per women of completed fertility	4.09 ± 0.55
Variance of mean live births	3.64

* 1 TWIN BIRTH

Table-2

Index of selection potential in some population groups of Assam

Population	According to Crow (1958)			According to Johnston and Kensinger (1971)				Source
	I_m	I_f	I	I_{me}	I_{mc}	I_f	I	
Dibongiya Deori	0.0969	0.3087	0.4339	0.0614	0.0922	0.3087	0.5165	Present Study
Tengaponia Deori	0.108	0.181	0.309	0.073	0.108	0.181	0.403	Gogoi, 2006
Borgonya Deori	0.045	0.166	0.219	0.200	0.045	0.166	0.461	Gogoi, 2006
Dibongiya Deori	0.046	0.123	0.174	0.098	0.046	0.123	0.290	Gogoi, 2006
Sonowal	0.185	0.179	0.364	0.103	0.185	0.179	0.541	Deka, 1980
Sonowal	0.167	0.163	0.358	0.053	0.167	0.163	0.432	Sengupta, 2004
Ahom	0.083	0.118	0.218	0.074	0.083	0.118	0.308	Sengupta, 2004
Khampti	0.179	0.113	0.312	0.005	0.005	0.133	0.319	Sarkar *et al*., 1994
Boro Kachari	0.110	0.130	0.250	-	-	-	-	Guha and Mukherjee, 1990
Semsa	0.320	0.250	0.650	-	-	-	-	Choudhury *et al.,* 2001
Semsa	0.471	0.098	0.616	0.038	0.038	0.098	0.677	Limbu and Khongsdier, 2000
Pnar Khasi	0.104	0.234	0.363	0.047	0.047	0.234	0.428	Khongsdier *et al.,* 2001
Munda(Hindu)	0.1399	0.0623	0.2109	0.0987	0.1399	0.0623	0.3304	Phukon Gogoi and Sengupta,2013
Munda(Christian)	0.1663	0.0745	0.2532	0.1347	0.1663	0.0745	0.4220	Phukon Gogoi and Sengupta,2013
Munda	0.1509	0.0671	0.2281	0.1154	0.1509	0.0671	0.3698	Phukon Gogoi and Sengupta, 2013
Oraon (Hindu)	0.1823	0.0529	0.2448	0.0935	0.1823	0.0529	0.3612	Phukon Gogoi and Sengupta, 2013
Oraon(Christian)	0.1677	0.0724	0.2522	0.1255	0.1677	0.0724	0.4094	Phukon Gogoi and Sengupta,2013
Oraon	0.1761	0.0599	0.2465	0.1069	0.1761	0.0599	0.3798	Phukon Gogoi and Sengupta, 2013
Savar	0.1298	0.0626	0.2005	0.0908	0.1298	0.0626	0.3095	Phukon Gogoi and Sengupta, 2013
Oraon	0.098	0.131	0.243	0.102	0.098	0.131	0.369	Sengupta, 2004

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