

Opportunity for Natural Selection Among The Dalu of West Garo Hills, Meghalaya

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KEY WORDS Dalu. Selection Intensity. Fertility. Mortality.

ABSTRACT The index of total opportunity for selection based on differential fertility and mortality has been worked out for the Dalu of West Garo Hills, Meghalaya. From the analysis, it emerges out that the total selection intensity in this population is moderate and operates more through differential mortality than through differential fertility. The total selection intensity as per the formula given by Johnston and Kensinger (1971) is found to be slightly higher than what is found following the Crow's formula (1958).

INTRODUCTION

Selection, one of the evolutionary forces, is responsible for gene frequency variation in a population which in turn could be measured through differential fertility and mortality. A measure was devised by Crow (1958) as an Index which is known as Index of opportunity for selection. His method has been modified by Johnston and Kensinger (1971). Crow's index and its components due to fertility and mortality have been widely used to study variations among population groups inhabiting diverse physical and socio-cultural environments, despite criticisms regarding the concepts underlying the index (Spuhler, 1962; Morton, 1970). In India, it is generally acknowledged that micro-studies concerning fertility and mortality differentials are relatively infrequent, particularly in the north-eastern region of the country.

In the present paper, an attempt has been made to examine the intensity of natural selection among the Dalu of West Garo Hills, Meghalaya as well as to compare the present findings with those already reported from populations from the north-eastern regions. The Dalu is a Bengali speaking Hindu population having low socio-economic status and mostly live in

the southern plains of the West Garo Hills district. The Dalu is neither a scheduled tribe nor a scheduled caste but a very small and isolated population. This population has never been studied from the anthropological point of view.

MATERIALS AND METHODS

The present data were collected from three villages viz. Killapara, Choipani and Barengapara, in the West Garo Hills during the month December, 1994 and January, 1995. The entire demographic data were collected from 112 married women and the data presented here comprised of 39 mothers who had completed 40 years. The fertility and mortality data were collected using a structured schedule/questionnaire. In the present study we have used both Crow's and Johnston and Kensinger's formula to understand how selection is operating in the Dalu.

RESULTS AND DISCUSSION

The data used for calculating total selection intensity have been presented in table 1. According to Crow's formula, in the Dalu population the total selection intensity is found to be 0.8471 with its mortality component 0.4999 and fertility component 0.2315 (Table 2). The mortality component is higher than the fertility component. It means selection operates more through differential mortality than through differential fertility. However, it seems that the total selection intensity in this population is moderate. According to Johnston and Kensinger's modified formula (1971) selection intensity is found to be 0.8974. The fertility and mortality components are same as found in the earlier

Table 1: Data used in calculating the index of total selection intensity

S. No.	Parameters	Values
1.	Number of mothers aged 40 years and above	39
2.	Number of reported pregnancies	236
3.	Number of livebirths	231
4.	Proportion of survivors to birth (P_b)	0.9788
5.	Proportion of child death (death before 15 years) (P_d)	0.3333
6.	Proportion of embryonic death (P_{ed})	0.0212
7.	Mean No. of livebirths per mother aged 40+years(x)	5.923
8.	Variance (V_x)	8.123

Table 2 : Indices of selection intensity in the Dalu

According to Crow (1958)			According to Johnston and Kensinger (1971)			
I_n	I_f	I	I_m	I_{mc}	I_f	I
0.4999	0.2315	0.8471	0.0318	0.4999	0.2315	0.8974

calculation. But the prenatal mortality component is found to be 0.0318. It appears that the total selection intensity as per the formula given by Johnston and Kensinger (1971) is found to be slightly higher than what is found following Crow's formula (1958). However, between these two sets of calculation no remarkable difference is noticed in total selection intensity acting on this population. It may be pointed out that the selection pressure on this population is moderate and it falls towards the lower half of the range, given by Reddy and Lakshmanadu (1979), Rao and Choudhury (1986) and Reddy and Chopra (1990) on the Indian populations.

Reddy and Chopra (1990) have compiled all the results on the indices of selection, calculated according to Crow's formula (1958) on the Indian populations. Looking at these ranges of variation of fertility component, mortality component and total intensity index, it can be said that among the Dalu the fertility and mortality components and the index of selection intensity are closer to the lower half of those ranges.

In comparison to other available populations from North-East India, the total selection inten-

sity (by Crow's method) among the Dalu is higher except Bengali Muslims (Chakravarty, 1976), Apatani and Singpho (Padmanabham and Jaswal, 1982). As far as the mortality component among the Dalu is concerned it is found to be higher than others except Gallong (Chakravarty and Ahmed, 1989) and the fertility component among the Dalu falls in the middle of the range.

The total selection intensity (by Johnston and Kensinger) among the Dalu is found to be higher than others. The total selection intensity range is 0.3190 in Khamti (Sarkar et al., 1994) to 0.8140 in Jaintia (Deka, 1989). Whereas embryonic mortality (I_{mc}) is moderate, child mortality (I_m) is higher than in others, which ranges 0.830 in Ahom (Sengupta and Chakravarty *c.f.* Sengupta and Gogoi, 1995) to 0.4560 in Jaintia (Deka, 1989).

Thus it can be said that the total selection intensity in Dalu is moderate and operates more through differential mortality than differential fertility.

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