

Opportunity for Natural Selection Among the Ladiya of Madhya Pradesh

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ABSTRACT The index of total opportunity for selection with its fertility and mortality components has been reported among the Ladiya of Sagar district, Madhya Pradesh. According to Crow's formula and Johnston and Kensinger's modified method, the total selection intensity is found to be 0.5216 and 0.5678 respectively.

INTRODUCTION

Any differential in fertility or mortality is natural selection, which helps to measure the fitness of a particular population in a particular environment. Population geneticists such as Spuhler (1973) have regarded it as a genetic phenomenon that has been operating in all human populations. The index of opportunity for selection measures the maximum potential rate of change by selection, where zero indicates no change (Livingston and Spuhler, 1965; cf. Sarkar, 1997). The method for computing the index of total selection was formulated by Crow (1958). This was modified by Johnston and Kensinger (1971) to incorporate the embryonic mortality component. Though a large number of studies have already been carried out in India to find out the selection intensity among different population groups, no such investigation has been undertaken among any scheduled caste group of Madhya Pradesh to the best of authors knowledge. Hence, an endeavour is made in the present paper to deal with intensity of natural selection among the Ladiya of Madhya Pradesh.

MATERIALS AND METHODS

The present study was carried out during April, 1999 on 188 unrelated women belong to the Ladiya, a sub-group of the Chamar community residing in Pathariya Jat village of

Sagar district, Madhya Pradesh. The demographic data necessary for calculating the indices of selection intensity were gathered through in-depth interviews. A total number of evermarried Ladiya women 64 were older than 45 years. The index of opportunity for selection (I) and its fertility and mortality components (I_f and I_m) were calculated following the formulae of Crow (1958) and Johnston and Kensinger (1971).

RESULTS AND DISCUSSION

Table 1 shows that the 64 Ladiya mothers had altogether 508 pregnancies, out of which 500 terminated into live births. The mean number of live births per mother aged 45 years and above is 7.8125 with a variance of 5.4649, whereas the proportion of premature deaths (those individuals who died before 15 years of age) is found to be 0.2840.

The indices of selection intensity calculated according to Crow (1958) and Johnston and Kensinger (1971) are shown in table 2. It reveals that the mortality component (I_m : 0.3966) is higher than the fertility component (I_f : 0.0895), whereas the embryonic mortality component (I_{me} : 0.0304) is found to be lower than the fertility component. However, both the calculations indicate that the differential mortality contribute more

Table 1: Variables of the index of total selection intensity

Total number of mothers aged 45 years and above	=	64
Number of reported pregnancies	=	508
Number of live births	=	500
Proportion of premature deaths (P_d)	=	0.2840
Proportion of embryonic deaths (P_{ed})	=	0.0295
Proportion of survivors upto birth (P_s)	=	0.9705
Mean number of live births per woman aged 45 years and above	=	7.8125
Variance in the number of live births (V_b)	=	5.4649

Table 2: Indices of selection intensity

Calculated according to Crow's (1958) formula			Calculated according to Johnston and Kensinger's (1971) formula			
I_m	I_f	I	I_{me}	I_{mf}	I_f	I
0.3966	0.0895	0.5216	0.0304	0.3966	0.0895	0.5678

towards the total opportunity for selection. It is further seen that index of total selection (I) calculated according to Crow (1958) is comparatively lower than that calculated according to Johnston and Kensinger (1971). This is probably because of the inclusion of embryonic deaths in the latter.

It reveals that the index of total opportunity for selection among the Ladiya is more towards the lower level of the range of Indian populations which varies from 0.24 to 2.25 (Reddy and Lakshmanudu, 1979; Basu, 1972). Such as the Maheswari ($I = 0.555$) of Maharashtra (Gandhi, 1989), Mala ($I = 0.575$) of Andhra Pradesh (Reddy and Lakshmanudu, 1979), Muria Joria ($I = 0.550$) of Madhya Pradesh (Saha, 1981), Muslim ($I = 0.534$) of West Bengal (Roy and Bharati, 1982) show a similarity with the Ladiya in this context, whereas this index is much lower among the Mahisya ($I = 0.275$) of West Bengal (Bharati, 1981), Jatav ($I = 0.320$) of Uttar Pradesh (Mukherjee, 1974) and Brahmin ($I = 0.330$) of Andhra Pradesh (Rajani Kumari et al., 1985) in comparison to that of the present study. However, the Madiga ($I = 1.545$) of Andhra Pradesh (Rao and Murthy, 1984), Jalari ($I = 1.078$) or Orissa (Reddy, 1983) and Kota ($I = 1.367$) of Tamil Nadu (Ghosh, 1970) show a higher value of the index of total opportunity for selection than the Ladiya.

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