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Opportunity of Natural Selection Among the Koraga Tribe of Karnataka

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ABSTRACT Among the Koraga tribe of Karnataka, Crow's index of opportunity of Selection (I) is 0.336. This is the lowest value reported so far tribal populations of India. Mortality Component (I_m) is (0.075) also the lowest value among the Koraga. Koraga have a mean live births of 3.97. The percentage of fertility component is more than 3 times to that of mortality component. Thus natural selection operates with low intensity through differential fertility rather than differential mortality.

INTRODUCTION

Crow (1958) had devised an index to measure the maximum amount of differential mortality and fertility in a population. He calls this as the Index of Total Selection, and renamed it as the Index of Opportunity of Selection in 1966. Since, if all such variation is due solely to differences in the value of the associated genotypes, then its value is a function of the effectiveness of the natural selection. However, the reproductive outcome is also known to be affected by sundry socio-cultural factors; therefore the index of opportunity of selection sets only an upper limit of selection than can take place in any population. The estimated inherited pre-reproductive mortality (Civilli-Sforza and Bodmer 1971) and fertility (Philippe and Yell, 1978; Imaizumi et. al., 1970; and Henneberg, 1985) were found to be low than the estimates obtained by Crow's index. Hence, the index instead of total selection value, it gives only the upper limit of selection value that can take place in a particular population. Further, the index may be separated into two components; reflecting differential postnatal mortality and differential fertility, allowing a closer scrutiny of the relative effects of these aspects of selection potential.

We have made an attempt to study these indices for the Koraga tribe of Karnataka. The Koraga rank socially even below the Holayas, a scheduled caste of Karnataka. Koragas inhabit at the outskirts of towns and villages. The present study Koraga population is distributed in and around Mangalore, a district head quarter and Udupi, a taluk headquarter. Koragas traditional occupation is basket making and labour. They are also employed as scavengers by the sanitary department. Koragas are used to eat flesh of dead cattle and left over food by the other castes, for which they ay be considered as much polluted and treated as the lowest people in the society.

MATERIAL AND METHODS

For the present purposes, we utilised a sample of 39 mothers who are in 40's and above, and supposed to have completed their fertility period. These data were collected in connection with the genetic survey of Koraga tribe during March and April 1996. Women's reproductive history had been collected by in-depth personal interview and pedigrees. The data pertaining to age and other parameters were crosschecked from the other family members and/or neighbouring relative family members. Basing on the reproductive information we have calculated only Corw's original index of selection, but not the modified one (Johnston and Kensinger, 1971) due to the difficulty in recollecting the prenatal mortality by all women especially illiterates with no formal education and written medical records.

RESULTS AND DISCUSSION

In the present study out of 123 married women 39 fertility completed mothers constitute the present sample size who had given birth to 155 children, of whom 144 had survived beyond 15 years of age. This yielded a probability of survival, P_s from birth to marriage of 0.93.

Table 1 shows the fertility and mortality parameters used in the calculation of selection potential. Using the above data, we have calculated the index of opportunity of selection (Table 2). Considering the postnatal aspects, the mortality component is observed to be 0.0753 and that due to differential fertility it is 0.2611. Thus, the effectiveness potential selection due to differential fertility is more than 3 times to differential mortality. The lower mortality component (I_m) can be explained due to lower mortality rate and relaxation of selection in the study area because of comparatively better medical care and facilities. The lower fertility component is due to lower fertility differential within the Koraga population. The mean live berths of 123 women (all) is 2.83, mean live births of 39 women (who are in 40's and above years) is 3.69 and mean live berths of women who adopted family planning methods (19 people) is 2.84. The low fertility may be due to family planning programme, socio-economic conditions and psychological attitude of the people. Thus the total index of selection is 0.336, which means the selection operates with low intensity through differential fertility rather than differential mortality.

Table 1: Parameters used in calculation of selection potential

Number of women (40 years + above)	= 39
Number of Live Births	= 155
Mean of Live Births	= 3.97
Variance of Live Births	= 4.4352
Proportion of Survivers, birth to reproductive age (P_s)	= 0.93

Table 2: The index of opportunity for total selection

Index of Selection due to mortality (I_m)	=	0.0753
Index of Selection due to Fertility (I_f/P_s)	=	0.2611
I_f	=	0.2808
Index of opportunity for total selection	=	0.3364
Percentage of fertility component	=	77.6%
Percentage of mortality component	=	22.4%

When these results are included and compared with other tribal studies in India, the total index value ranges from 0.336 among Koraga of the present study to 1.186 among Pardhas of Andhra Pradesh and 2.250 which is exceptionally high among the Kota 1 of Nilgiri hills (Table 3). The total index of exceeding the value if 1 is found among 5 tribal populations, whereas.

Table 3: Crow's index of opporunity for total among tribes of India

S. No.	Population	No of women	Live Births Mean	Live Births Variance	% died < 15 years	I_m	I_f	I	Reference
1.	Chenchu	146	5.7	6.65	33.4	0.5	0.2	0.81	Sirajuddin and Basu, 1984
2.	Hill Kolam	104	5.81	9.42	30.7	0.44	0.3	0.87	Murthy & Ramesh, 1978
3.	Kolam	229	5.65	9.42	30.7	0.44	0.3	0.87	Murthy & Ramesh, 1978
4.	ManneKolam	125	5.51	9.3	35.1	0.54	0.31	1.01	Murthy & Ramesh, 1978
5.	Pardhars	28	6.18	8.47	44.5	0.8	0.22	1.19	Murthy & Ramesh, 1978
6.	Raj Gonds	52	4.52	5.86	25.7	0.35	0.29	0.72	Murthy & Ramesh, 1978
7.	Sugalis	73	6.08	5.97	27.3	0.38	0.16	0.61	Reddy & Reddy, 1991
8.	Jaintias	39	8.1	8.18	31.3	0.45	0.13	0.64	Ance Deka, 1989
9.	Naika	49	5.71	4.4	23.4	0.31	0.14	0.48	Padmanabham, 1985
10.	Naika	85	4.48	5.42	31.4	0.46	0.26	0.83	Padmanabham, 1985
11.	Muria Joria	–	5.1	6.37	19.8	0.25	0.24	0.55	Saha, 1981
12.	Hajongs	51	6.8	5.9	30.7	0.44	0.13	0.63	Barua, 1983
13.	Irula	279	5.03	9.36	19.9	0.33	0.37	0.82	Reddy, 1981
14.	Kota I	120	4.01	13.7	44.4	0.79	0.82	2.25	Basu, 1972
15.	Kota II	328	3.73	8.87	30.8	0.45	0.64	1.37	Gosh, 1970
16.	Lepcha	–	5.83	9.99	10	0.11	0.29	0.44	Mukhopandhyaya, 1982
17.	Lepcha	–	7	22.75	23.2	0.3	0.46	0.9	Mukhopadhyaya, 1982
18.	Pahira (North)	39	4.97	4.33	44.9	0.81	0.18	1.13	Basu, 1967
19.	Pahira (Southern I)	50	5.44	4.05	34.6	0.53	0.14	0.74	Basu, 1967
20.	Pahira (Southern II)	50	5.7	4.45	32.6	0.48	0.14	0.69	Basu, 1967
21.	Sherpa	–	7.44	9.36	17.2	0.21	0.17	0.42	Gupta, 1980
22.	Sherpa	–	4.53	6.15		0.15	0.3	0.5	Gupta, 1980
23.	Toto	40	7.83	5.82	24.1	0.32	0.1	0.35	Debnat & Sen, 1983
24.	Kora	151	5.8	7.82	22.6	0.29	0.23	0.39	Basu et al., 1995
25.	Koraga	39	3.97	4.44	7.1	0.08	0.28	0.34	Present Study

among 20 tribal populations the total index is less than I. It is observed among 18 (72%) tribal populations differential mortality component value is higher than that of differential mortality. Nearly about 28 percent of tribal populations including the present population show lower I_m than I_f due to accessibility of medial facilities in the respective areas.

Mean live births, rate of mortality > 15 years of age and Crow's index of opportunity for total selection are low in Koraga tribe than the other tribes of India.

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