

Opportunity for Natural Selection in Ksyatriya, of Andhra Pradesh, India.

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Abstract

The selection intensity indices were computed based on the demographic information pertaining to fertility and mortality among Ksyatriya Caste, an endogamous caste population of Andhra Pradesh. The total fertility and mortality indices are slightly higher than other Andhra populations studied earlier. In the present population, the selection is manifested mainly through differential fertility rather than mortality, which is a deviation from general trend. The results are discussed in the light of earlier studies on Andhra Pradesh castes / tribal populations.

Keywords: Natural Selection, Fertility, Mortality, Andhra Caste

Introduction

The concept of natural selection is well recognized as a principal driving force of evolution. Natural selection operates through differential mortality and fertility among human populations. The differential mortality acts on individuals prior to their reproductive age and determines that group of individuals who survive and potentially produce the offspring to constitute the next generation of a population. It is probable that natural selection operating through differential mortality is less important among modern human populations where differential fertility appears to be the more effective agent. Based on these concepts, Crow (1958) devised an index of the opportunity for natural selection (I_t) to quantify the influence of selection inherent in evolutionary process. It possessed two

components: (i) due to mortality prior to the reproductive age (I_m) and (ii) due to differences in fertility among women who have reached reproductive age (I_f). Since this index covers mortality only at the postnatal age, Johnston and Kensinger revised this computation by considering the prenatal mortality too (Johnston and Kensinger 1971). The present paper aimed to estimate the intensity of selection in terms of Crow's as well as Johnston and Kensinger's indices among Ksyatriya, an endogamous caste population of coastal Andhra Pradesh

Materials and Methods

The present paper is based on the demographic data on the reproductive histories of 101 women of Ksyatriyas living in rural and semi urban areas of West

Godavari district of Andhra Pradesh. The demographic information pertaining to fertility and mortality was obtained through interviewing married women using a pre-tested schedule. The collected data covered the fertility rate, and the mortality rates at both prenatal (abortions and still births) and postnatal stages (childhood/pre reproductive deaths). In the present study, indices of

opportunity for natural selection were computed by using original formula of Crow (1958) and modified formula of Johnston and Kensinger (1971).

Results and Discussion: The indices of intensity of natural selection among Ksyatriyas are presented in Table 1.

Table 1: Indices of opportunity for natural selection intensity among Ksyatriyas population of coastal Andhra Pradesh

Selection component	Value
<u>Crow's Index</u>	
Mortality component (I_m)	0.0424
Fertility component (I_f)	0.4924
Total Index I_t	0.5384
Percentage of fertility component	95.18%
<u>Johnston and Kensinger's Index</u>	
Prenatal mortality component I_{me}	0.0745
Postnatal mortality Component I_{mc} / P_b	0.0427
Fertility Component $I_f / P_b.P_s$	0.4758
Total index	0.5260
Percentage of P_b / P_s	53.01%

* I_f , I_m and I_{me} are from Crow's method, and I_{mc} is from Johnston and Kensinger's method.

The Crow's total index of natural selection is 0.5384. The fertility and mortality components of Crow's index are 0.4924 and 0.0424, respectively. The contribution of fertility to the total index is greater than the contribution of mortality in this caste. It depicts that the selection in this populations is manifested through fertility component,

rather than mortality. The total index based on Johnston and Kensinger's method (0.5260) is slightly higher than the index of Crow (0.5384), due to additional contribution of prenatal mortality. The contribution of prenatal mortality (0.0745) is higher than that of postnatal mortality (0.0427).

Table 2: Selection intensity indices among some Andhra castes and tribes
Table – 2

Selection intensity indices among some Andhra Castes and Tribes

Castes	I	I_f	I_m	I_{me}	Source
Castes					
Ksyatriya	0.53	0.49	0.04	0.07	Present Study
Koppula velama	0.37	0.30	0.06	0.18	Sudhakar,1993
Rajaka	0.28	0.12	0.16	0.03	Parvatheesam and Babu,1997
Chakali	0.63	0.43	0.20	0.02	Babu et al., 1995
Pattapu	0.67	0.19	0.37	0.011	Srinivasa Rao,1991
Palle	0.65	0.16	0.38	0.024	Srinivasa Rao, 1991
Jalari	0.31	0.12	0.19	-	Rajani Kumari et al., 1985
Kummari	0.95	0.63	0.32	-	Babu et al, 1995
Madiga	0.70	0.47	0.23	0.02	Babu et al, 1995
Maheswari	0.50	0.30	0.20	-	Rao and Murthy, 1984
Mala I	0.58	0.36	0.22	0.02	Reddy and Lakshmandu, 1979
Mala I I	1.69	0.63	1.06	-	Rao and Murthy, 1984
Mangali	0.68	0.48	0.20	0.04	Babu et al 1995
Palle	0.94	0.50	0.44	-	Reddy et al, 1987
Reddy I	0.61	0.40	0.21	-	Reddy and Reddy, 1984
Reddy II	0.43	0.26	0.17	-	Reddy and Reddy, 1984
Reddy III	0.75	0.33	0.42	-	Rao and Murthy, 1984
Vada	0.69	0.34	0.35	-	Reddy et al, 1984
Vyshya	0.70	0.28	0.42	-	Rao and Murthy, 1984
Brahmin	0.33	0.20	0.13	-	Rajani Kumari et al, 1985
Madiga I	0.81	0.57	0.24	0.05	Reddy et al, 1984
Madiga II	0.75	0.29	0.46	0.09	Reddy et al, 1984
Tribes					
Yerukala	1.24	1.05	0.19	0.16	D.S.R.S.Prakash, 1999
Manne Dora	0.82	0.35	0.41	0.06	Ramana, 1991
Kolam	0.86	0.41	0.44	0.01	Murthy and Ramesh, 1978
Pardhan	0.88	0.41	0.46	0.01	Murthy and Ramesh, 1978
RajGond	0.73	0.38	0.35	-	Murthy and Ramesh, 1978
Chenchu	1.45	0.96	0.49	-	Sirajuddin, 1984
Yerukala	0.79	0.44	0.35	-	Narahari, 1982

The present study results are compared with the data available for other caste and tribal populations of Andhra Pradesh (Table 2). Among Andhra castes, the lowest and the highest values of total selection intensity index were recorded by Rajaka, a washermen community belonged to backward class (Parvatheesam and Babu

1998) and Mala II, a scheduled caste (Rao and Murthy 1984), respectively. The range of index of fertility among caste populations is 0.12 (Jalari - Rajani Kumari et al. 1985 and Rajaka - Parvatheesam and Babu 1998) to 0.63 (Mala II - Rao and Murthy 1984); and among tribal populations, this range is from 0.35 (Manne Dora – Ramana 1991) to

1.05 (Yerukula - D.S.R.S.Prakash, 1999). The index varies from 0.53 in Kshatriya (present study) to 1.45 in chenchu, (Sirajuddin, 1984). It is observed that in no caste Population except Mala II 1.69 (Rao and Murthy, 1984), records the total index more than one, and in some tribal Populations Yerukala, 1.2433, Prakash,1999 and Chenchu 1.45, sirajuddin, 1984 exceeds the value of one. The index of mortality varies from 0.04 reported among Kshatriyas (Present study, a forward caste in Hindu hierarchy, sampled from urban areas with better health and socio-economic background to 1.06 found among Mala, a scheduled caste living in rural areas (Rao and Murthy 1984). Among castes, the index of mortality varies from 0.04 among the Kshatriyas (Present study) to 1.06 among Mala II, a scheduled caste (Rao and Murthy 1984). The component of prenatal mortality is very low among the Kshatriyas (present study) of Andhra populations. Of the 22 caste groups listed in the table 2, the selection is manifested through fertility component rather than mortality among 13 groups. In nine caste groups, the mortality component is higher than that of fertility. The present study Andhra caste along with majority of Andhra populations is deviate from the general trend observed among castes and agrarian societies where the contribution of mortality is higher than that of fertility (Cavalli-Sforza and Bodmer 1971). The present study people of Kshatriyas are inhabitants of well-developed rural and semi urban area are very rich in economically in the present society and maintain hygiene food and care with better public health care and modern facilities, and hence the mortality is playing lesser role in the manifestation of selection. However, these indices give an indication of relative opportunity for natural selection as these results are based on the data in which both

genetic and non-genetic elements are involved. The present study Kshatriyas belongs to upper Caste / forward caste in social strata and exhibit their own traditional values.

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CONFLICT OF INTEREST:- Non declared

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