

Taste Sensitivity to PTC and Incidence of Colour Blindness Among the Schedule Castes of District Mandi, Himachal Pradesh

Sunil Kumar and A.K. Kapoor

INTRODUCTION

Phenylthiourea or Phenylthiocarbamide (PTC) is a chemical compound, which divides the people into two groups, one is a taster and another is a non-taster. Those people who are able to taste PTC and perceive a bitter taste called taster while those who are not able to taste or not receive any taste called non- taster. Taste perception phenomenon presents an excellent opportunity to the population geneticists and anthropologists for the study of human variability.

Post (1962) observed the frequency of colour blindness is less among the hunting and gatherers community which was supported by Pickford (1963). Later Dutta (1966), Malhotra (1978), Kapoor et al. (1983), used Post's hypothesis to study various ethnic groups from India. Bhasin and Walter (2001).

In the present paper an attempt has been made to study the PTC and colour blindness among the scheduled castes namely Chamars and Kolis of District. Mandi, Himachal Pradesh which comes under the Western Himalayan region.

MATERIALS AND METHOD

The data for the two polymorphic system i.e. PTC taste sensitivity and colour vision deficiency were collected from the Sunder nagar District Mandi, Himachal Pradesh. The subjects consist of both the sexes, which were taken from various primary and secondary schools situated in the Sunder nagar region.

146 Chamars (78 males and 68 females) and 138 Koli (82 males and 56 females) have been tested for their ability to taste PTC following the technique of Harris and Kalmus (1949) with the modification (Seth, 1961). Care was taken to avoid the close relation from being included in the sample. Same numbers of individual were tested for colour vision with the help of Ishihara isochromatic colour plates in a room with a

sufficient day light.

RESULTS AND DISCUSSION

The percentage and gene frequency of tasters and non-tasters have been given in table 1. Among the Chamar, the tasters are 71.91% while non-tasters are 28.08% and the gene frequency of non-tasters is 0.5299. In the Koli the percentage of tasters are 78.98% and non-tasters are 21.01 % and gene frequency of non-tasters is 0.4584.

In the table 2 Mean, S.D. and D/S value are presented. The mean value of tasters and non-tasters among Chamar has been found to be 9.0095 and 1.2165 respectively, while in Kolis the mean value of taster is 9.7156 and for non-taster it is 1.5517.

The D/S index of Penrose was used to determine the bi-modality of the distribution. It has been observed that the D/S value for Chamar and Koli has been found to be higher which confirms bimodality of the distribution.

Kolis and Chamar show statistically non-significant differences for tasting ability.

The gene frequency of non-tasters in Chamar and Kolis are 52.99% and 45.84%, respectively and it appear that the high percentage of non-tasters gene is due to the low amount of Mongoloid element in this region (Tiwari and Kapoor, 1984).

Table 3 shows the percentage of incidence of colour blindness in two caste groups. Among the Chamar males, the percentage of colour blindness has been found to be 5.1% whereas it is 4.9% in Koli males. All the females in both the groups are normal.

When compared with the other population it is observed that the Kolis of Sundernagar shows non-significant differences with the Chamar. Some higher caste of the Himalayan region like Rajput of Kulu, Brahman of Shimla, Rajput and Brahman of Garhwal also show the non-significant differences with Kolis of Sundernagar with reference to the tasting ability to PTC. Dogra

Table 1: Percentage and gene frequency of tasters of non-tasters among Scheduled Castes of Himachal Pradesh

S.No.	Population	Sample	Taster	Non-taster	Percentage		Gene Frequency	
					Taster	Non-taster	Taster	Non-taster
1.	Chamar	146	105	41	71.91	28.08	0.4701	0.5299
2.	Koli	138	109	29	78.98	21.01	0.5416	0.4584

Table 2: Mean, S.D. & D/S value among the Scheduled Castes of Himachal Pradesh

S.No.	Population	Mean		S.D.		D/S
		Taster	Non-taster	Taster	Non-taster	
1	Chamar	9.0095	1.2163	2.0541	1.2398	4.73
2	Koli	9.7156	1.5517	1.9634	1.6313	4.54

Table 3: Percentage of incidence of colour blindness among the Scheduled Castes of Himachal Pradesh

S.No.	Population	Sex	No. tested	Normal		Colour blind	
				Number	%	Number	%
1	Chamar	Male	78	74	94.1	4	5.1
2	Chamar	Female	68	68	100	-	-
	Total		146	142	97.3	4	2.7
3	Koli	Male	82	78	95.1	4	4.9
4	Koli	Female	56	56	100	-	-
	Total		138	134	97.1	4	2.9

of Tawi valley, Rajput of Kumaon, Brahman of Kumaon show significant differences with the Kolis.

The Chamar show non-significant differences with Dogra of Tawi valley, Rajput of Kulu, Brahman of Simla and Rajput of Simla whereas Brahman of Bilaspur, Rajput of Bilaspur, Rajput of Kumaon show the significant difference with the Chamar for PTC tasting ability.

Most of the Eastern Himalayan populations show a low frequency of non-tasters gene. There is nothing unusual about these frequencies since Mongoloid populations are characterized by a low frequency of non-taster gene (Tiwari and Kapoor, 1984). When we move from the Eastern Himalayas to Western Himalayas the non-taster-gene frequency shows the increasing trend. From the result it has been observed that, in the present study the 't' is 52.99%, which is quite high and in the Kolis the gene percentage of 't' is 45.84%,

which is also high. So both the caste groups fall in the range of high non-tasters gene frequency of the Western Himalayas.

As we move from the Eastern Himalayas to Western Himalayas the relative Mongoloid strain decreases with increases in the non-taster gene frequency. In the present populations the non-taster gene frequency is quite high and in both populations, which is native of Western Himalayas, have less Mongoloid characteristics and high non-taster gene frequency and high percentage of incidence of colour blindness.

KEY WORDS PTC. Colour Blindness. Chamar. Koli. Himalayan Population.

ABSTRACT PTC taste sensitivity in 146 Chamar and 138 Koli from Dist. Mandi, H.P reveals bimodal distribution of tasters and non-tasters; the incidence of tasters being 71.91% for Koli. There is a non-significant difference in their ability to taste PTC ($\chi^2 = 1.9080$) among Chamar and Koli. The percentage of incidence

of colour blindness among Kolis has been found to be 2.9% while in the Chamar it is 2.7%, respectively.

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Authors' Address: Sunil Kumar and A.K. Kapoor, Department of Anthropology, University of Delhi, Delhi 110 007, India