GENE AND GENOTYPIC FREQUENCY AND PERCENT OF BITTER TASTERS OF PHENYL-THIOCARBAMIDE IN A STUDENT COMMUNITY OF DIFFERENT CASTES

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INTRODUCTION

Caste system, genetically is a form of inbreeding wherein the given gene flow freely in a given group or caste. Dominance and recessiveness of alleles do not directly influence allele frequency, meaning thereby that dominance alone does make an allele occur more frequently in the population. The ability or inability to taste phenyl-thiocarbamide (PTC) has no selective value. A hereditary basis for the mechanism was postulated to account for tasters and non-tasters. Hence inability to taste the chemical (taste blindness) was found to be dependent upon a single recessive allele 't'. The present study was initiated to evaluate the gene frequency of this trait among castes of student community of a local college at Faisalabad.

SUBJECTS ,METHODS AND RESULTS

This paper deals with PTC taste blindness test applied for the first time on student community of a local college belonging to different castes. Taste blindness is an inherited inability to taste PTC and a Mendelian recessive trait. The data for the PTC tasters and non-tasters were collected during the year 1985 and 1986 from the male students of the Government College, Faisalabad. They were between 15 to 25 years of age. Each student was provided with a piece of a paper of one centimeter square coated with 0.5% PTC and allowed to chew1. They were allowed to taste it for a period of two minutes to determine the taste. The results of taste blindness made on different castes of the student community are presented in the Table.

TABLE. Gene frequency, genotype frequency and percentage of bitter tasters of PTC on different castes groups.

	Gene Frequency		Gena-typic frequencies				
Castes	p	q	pz	2pq	q	No.	% of bitter
Arain	0.55	0.45	0.31	0.49	0.20	757	79.92
Butt	0.61	0.39	0.37	0.48	0.15	045	84.44
Gujar	0.55	0.45	0.30	0.50	0.20	040	80.00
Jat	0.56	0.45	0.31	0.49	0.20	253	80.24
Jolaha	0.38	0.62	0.15	0.47	0.38	068	61.77
Kumbar	0.51	0.49	0.26	0.50	0.24	033	75.76
Malik	0.57	0.43	0.32	0.49	0.19	086	81.40
Mughal	0.38	0.62	0.15	0.47	0.38	052	61.54
Pathan	0.37	0.63	0.41	0.46	0.40	066	60.61
Qureshi	0.64	0.36	0.41	0.46	0.13	038	86.84
Shaikh	0.50	0.50	0.25	0.50	0.25	223	74.89
Syed	0.41	0.59	0.17	0.48	0.35	085	64.71
Rajput	0.49	0.51	0.24	0.50	0.26	242	74.38
Misc.	0.55	0.45	0.31	0.49	0.20	105	75.00
Mean	0.52	0.48	0.27	0.50	0.23	N=2100	76.62

The overall frequency for tasters (p) and non-tasters (q) were 0.52 and 0.48, respectively. The gene

frequency for tasters allele (p) ranged from 0.37 to 0.64 for different castes (Table). The gene frequency for tasters was maximum for Butt (p= 0.61) and Qureshi (p = 0.64) castes. However, it was low in Pathan (p = 0.37), followed byjolaha and Mughal (p = 0.38). The students havingArain and Gujar caste each had the gene frequency of 0.55 for tasteness. Six castes namely Arain, Butt, Gujar, Jat, Malik and Qureshi had a range of 0.55 to 0.64 for taster gene frequency. Similarly, seven castes (Jolaha, Kumhar, Mughal, Patban, Sheikh, Syed and Rajput) were in arange of 0.37 to 0.51 and were belowthe overall gene frequency non-tasters was maximum for Pathan (q=0.63) and category of tasters. The gene frequency for minimum for Qureshi (q= 0.36). The percentage of bitter tasters of PTC chemical ranged from 60.61 to 86.84% for Pathan and Qureshi castes, respectively (Table). Six castes out of thirteen were above the mean percentage (76.62%) of bitter taster. These included Arain, Butt, Gujar,Jat, Malik and Qureshi. However, the remaining castes were below the mean percentage of bitter taster.

COMMENTS

The results indicated that for all thirteen castes evaluated, the percentage of bitter taster ranged from 60.6 to 86.8% for Pathan and Qureshi castes, respectively. The gene frequency for taste blindness was maximum for Pathan (q= 0.63), Mughal and Julaha (q= 0.62) and minimum for Qureshi (q= 0.36). No caste in this studyhas yet being discovered in which every individual could be called as phenyl-thio-carbamide tasters or non-tasters. However, the gene frequency for either the taster or non-taster is equal (p = q= 0.5) for Sheikh caste (Table). The high percentage of tasters observed in Butt and Qureshi castes indicated that it is not unlikely that such a caste exists. Hence our results obtained indicated less likelihood of finding caste entirely taste blindness. The results strongly suggest that in majority of the castes, the system of inter- marriages operates which restricts the PTC taster gene to flow from caste to caste.

References

1. Parr, LW. Taste Blindness and Race. 3. Heredity. 1934; 25: 187-1.