

## PTC Taste Sensitivity and Colour Blindness in Rajaka Caste Group of Andhra Pradesh

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**KEY WORDS** PTC Tasting. Colour Blindness. Rajaka. Andhra Pradesh.

**ABSTRACT** The present paper reports the variability of PTC tasting ability and the incidence of colour blindness among Rajaka, a washermen caste in Andhra Pradesh. The frequency of non-tasters was recorded 41.01% and 1.40% subjects were found colour blind.

### INTRODUCTION

The ability to taste phenylthiocarbamide (PTC) and red-green colour blindness are widely used traditional genetic markers in the studies of human population variation. The ability to taste PTC is governed by a pair of alleles at an autosomal locus and red-green colour blindness is controlled by gene situated on X chromosome. This paper reports the distribution of these two markers among Rajaka, an endogamous caste population of Andhra Pradesh. Traditionally, the Rajaka is a washermen community and constitutionally, it is a backward class in Andhra Pradesh. The Rajaka is also referred to as Chakali or Dhobi. In fact, the word '*dhobi*' is used to mean washermen by Anglo-Indians (Thurston, 1975)

### MATERIALS AND METHODS

A sample of 217 unrelated individuals (105 men and 112 women) belonging to Rajaka caste living in Visakhapatnam city was surveyed. The tasting status for PTC by means of threshold was determined by serial dilution method after Harris and Kalmus (1949). The red green colour blindness was tested using Ishihara's (1980) plates during day time. The gene frequencies were computed following the methods illustrated by

Balakrishnan (1988).

### RESULTS AND DISCUSSION

#### *PTC Taste Sensitivity*

The distribution of PTC taste threshold levels among the Rajaka (Table 1) indicates that 26.67% of men and 14.29% women are not tasted at any threshold value. Majority of men (29.52%) and women (33.93%) tasted at threshold number 8. The distribution shows bimodality with an antimode lying between threshold numbers 3 and 4. Based on the bimodal distribution, the phenotype and allele frequencies of PTC taste sensitivity are estimated (Table 2). The difference in the proportions of non-tasters between men and women is marginal. Among total Rajaka individuals, 41.01% are non-tasters. The frequency of *t* allele is 0.6375. This frequency is relatively higher than the average *t* allele frequencies of both caste (0.5329) and tribal populations (0.5869) of Andhra Pradesh (Babu et al., 1995).

#### *Red-Green Colour Blindness*

A low frequency of protan (red) type of colour blindness is recorded among the Rajaka; two men and one women recorded this colour vision defect (Table 2). Deutan type of colour blindness was not detected in this survey. The review of data on the incidence of colour blindness (Naidu et al., 1988) indicates that 3.25% of individuals belonging to castes and 1.64% of tribals of Andhra Pradesh are colour blind. Also, it indicates that the incidence of deutan (green) blindness is

**Table 1 : Distribution of PTC taste thresholds among Rajaka**

Threshold number	Men		Women		Total	
	No.	%	No.	%	No.	%
<1	28	26.67	16	14.29	44	20.28
1	9	8.57	17	15.18	26	11.98
2	6	5.71	11	9.82	17	7.83
3	1	0.95	1	0.89	2	0.93
4	4	3.81	2	1.79	6	2.76
5	6	5.71	3	2.67	9	4.15
6	4	3.81	4	3.57	8	3.69
7	8	7.62	5	4.46	13	5.99
8	31	29.52	38	33.93	69	31.80
9	7	6.67	11	9.82	18	8.29
10	1	0.95	4	3.57	5	2.30
11-14	0	0.00	0	0.00	0	0.00
Total	105	100.00	112	100.00	217	100.00

**Table 2 : Distribution of phenotypes and allele frequencies of PTC taste sensitivity and colour blindness among Rajaka**

Particulars	Men	Women	Total
<i>PTC Taste Sensitivity</i>			
PTC tasters	61(58.10%)	67 (59.82%)	128 (58.99%)
PTC non-tasters	44 (41.90%)	45 (40.18%)	89 (41.01%)
Allele frequencies $\pm$ SE			
<i>T</i>	0.3527 $\pm$ 0.0372	0.3661 $\pm$ 0.0365	0.3596 $\pm$ 0.0261
<i>t</i>	0.6473 $\pm$ 0.0372	0.6339 $\pm$ 0.0365	0.6404 $\pm$ 0.0261
<i>Colour Blindness</i>			
Normal vision	103 (98.10%)	109 (99.09%)	212 (98.60%)
Colour blind (protan)	2 (1.90%)	1 (0.91%)	3 (1.40%)
Allele frequencies $\pm$ SE			
Normal	0.9810 $\pm$ 0.0133	0.9042 $\pm$ 0.0198	0.9650 $\pm$ 0.0168
Colour blind	0.0190 $\pm$ 0.0133	0.0958 $\pm$ 0.0198	0.0350 $\pm$ 0.0168

twice that of protan (red) type. Hence, the present caste group is quite different from other Andhra populations in terms of this trait.

#### ACKNOWLEDGEMENTS

Authors are grateful to Prof. G. Golla Reddi and Dr. G. Paddaiah of Andhra University for their help during this work.

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