



SARTHAK SENGUPTA

## DISTRIBUTION OF ABO BLOOD GROUPS AND COLOUR-BLINDNESS AMONG THE ASSAMESE CASTES

**ABSTRACT** — *The paper presents the ABO blood group distribution and frequency of colour-blind individuals of the three Assamese castes of Dibrugarh, Assam.*

**KEY WORDS:** *ABO blood groups — Colour-blindness — Brahmin — Kalita — Kaibarta — Assam — India.*

### INTRODUCTION

In the present paper an attempt has been made to measure the biological variation of the three Assamese castes viz. Brahmin, Kalita and Kaibarta of Dibrugarh, upper Assam in respect of ABO blood groups and colour blindness. Further the data have been compared with those of the Lower Assam reported by Das et. al. (1973) and Das and Das (1973) to ascertain similarities and differences between the results of these studies with those of the present one.

### MATERIAL AND METHOD

The sample was drawn from Dibrugarh town and its neighbouring villages in upper Assam. The total number of individual tested for blood groups was 233 (Brahmin-90, Kalita-43 and the Kaibarta-100) and 292 male persons (Brahmin-92, Kalita-60 and the Kaibarta 140) were further tested for colour blindness. Blood grouping tests were done by employing direct method. The ABO gene frequencies were calculated according to the formulae suggested by Mourant (1954) and necessary corrections were also

made (Bernstein 1930). The Ishihara colour plates (1962) were employed to find out the colour blind individuals. To evaluate regional variation the data of caste populations reported from Lower Assam (Das et al. 1973; and Das and Das 1973) have been considered.

### RESULTS AND DISCUSSION

The frequency distribution of ABO blood groups and gene frequencies in the caste populations are tabulated in *Table 1*. It is evident that the distribution of ABO blood groups in all the castes conform to the distributional pattern O B A AB, but in the Kaibarta of Lower Assam, the sequence of distribution is B O A AB.

Incidence of colour-blindness in three caste populations is presented in *Table 2*. The table shows that the frequency of colour-blindness is much higher (6.13%) in Upper Assam than that in Lower Assam (3.47%). It is further seen that in Upper Assam the frequency of colour-blindness increases from Brahmin through Kalita to Kaibarta, whereas it is in the reverse order in case of Lower Assam, where it decreases from Brahmin through Kalita to Kaibarta.

TABLE 1. Percentile distribution of ABO blood groups and gene frequency in the caste populations of Assam

Castes	n	O	A	B	AB	p	q	r
<i>Upper Assam</i> (Present study)								
Brahmin	90	42.22	21.11	31.11	5.56	0.145	0.206	0.648
Kalita	43	41.86	20.93	30.23	7.00	0.146	0.203	0.650
Kaibarta	100	35.00	25.00	30.00	10.00	0.184	0.216	0.598
<i>Lower Assam</i> (Das, Das and Das 1973)								
Brahmin	360	38.33	23.05	33.05	5.55	0.157	0.214	0.628
Kalita	454	38.54	24.22	31.29	5.94	0.165	0.208	0.626
Kaibarta	161	40.37	11.80	44.09	3.74	0.078	0.274	0.642

TABLE 2. Incidence of colour-blindness in the caste population of Assam

Castes	n	No of colour blind (%)	Source
<i>Upper Assam</i>			
Brahmin	92	4.35	Present study
Kalita	60	5.00	Present study
Kaibarta	140	7.86	Present study
<i>Lower Assam</i>			
Brahmin	145	4.14	Das and Das 1973
Kalita	330	3.64	Das and Das 1973
Kaibarta	101	1.98	Das and Das 1973

The frequency distribution of sub-types of redgreen colourblindness is shown in Table 3. It is apparent from the table that in the sample of Upper Assam, both the protan and deutan types gradually increases from Brahmin through Kalita to Kaibarta.

Chi-square values to ascertain significance of the difference between the sample from Upper Assam and Lower Assam in respect of ABO blood groups and colour blindness are shown in Table 4. It is observed that barring the Kaibarta sample of two different region, the observed difference in the other castes are statistically not significant. The caste populations of Upper Assam do not show any significant inter-group difference among them in respect of both the traits. However, the Kaibarta of Lower Assam also stand significantly apart from other two castes of the

TABLE 3. Sub-classification of the abnormal of caste population of Assam

Castes	Protan		Deutan		Total
	Strong	Mild	Strong	Mild	
<i>Upper Assam</i>					
Brahmin	—	2.17	2.17	—	—
Kalita	1.66	—	3.32	—	—
Kaibarta	2.14	0.71	3.57	0.71	0.71
<i>Lower Assam</i>					
Brahmin	—	—	2.06	0.69	0.69
Kalita	0.62	—	1.81	0.62	0.62
Kaibarta	0.99	—	0.99	—	—

same region in respect of ABO blood groups. Further, it may be noted with interest that the physical variation in respect of finger patterns and cerumen types among the above mentioned castes was observed by Das (1979). He observed more differences between Kaibarta and Brahmins and between Kaibarta and Kalita. At the present state of our knowledge it is difficult to arrive at any definite conclusion, because a host of factors like ethnic migration, inflow of genes and geographical isolation are involved to cause variation.

TABLE 4. Chi-square values to ascertain difference

Region	Caste combination	Chi-square values
<i>Upper Assam</i>	INTER GROUP VARIATION	
	(ABO blood groups) d.f. = 3	
	Brahmin × Kalita	0.1044
	Brahmin × Kaibarta	1.44
	Kalita × Kaibarta	0.8921
	(Colour-blindness) d.f. = 1	
	Brahmin × Kalita	0.3445
	Brahmin × Kaibarta	1.04
	Kalita × Kaibarta	0.4899
<i>Lower Assam</i>	(ABO blood groups) d.f. = 3	
	Brahmin × Kalita	0.36
	Brahmin × Kaibarta	11.76**
	Kalita × Kaibarta	15.52**
	(Colour-blindness) d.f. = 1	
	Brahmin × Kalita	0.062
	Brahmin × Kaibarta	0.853
	Kalita × Kaibarta	00.647
<i>Upper Assam Vs. Lower Assam</i>	REGIONAL VARIATION	
	(ABO blood groups) d.f. = 3	
	Brahmin × Brahmin	0.4815
	Kalita × Kalita	0.3739
	Kaibarta × Kaibarta	13.4000**
	(Colour-blindness) d.f. = 1	
	Brahmin × Brahmin	0.5693
	Kalita × Kalita	0.5883
	Kaibarta × Kaibarta	3.85*

\* indicates statistically significant at 5.0% level of probability

\*\* indicates statistically significant at 1.0% level of probability

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Dr. Sarthak Sengupta M. Sc. Ph.D  
Anthropological Survey of India  
North East Regional Office  
Shib Bhavan, Upper Lachumiere  
Shillong, Meghalaya, 793 001  
INDIA