

A STUDY OF SOME GENETIC MARKERS IN THE BAHAWALPURIS OF PATIALA, INDIA

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ABO blood groups, secretor factor, Rh-factor, and PTC taste ability have been examined in 360 individuals of Bahawalpuri population of Patiala. B and O blood groups are more frequent (44.46% & 31.36% respectively). Frequency of secretors (84.72%) outweighs that of nonsecretors (15.28%). All the individuals have been found to belong to Rh+ve type. High incidence of nontasters (55.55%) has been seen. Genes r, Se, D, and t are found to be most frequent in the population.

The present study was conducted on the Bahawalpuris of Tripuri township of Patiala with a view to explore the frequencies of some genetic markers, viz. ABO blood groups, secretor factor, Rh-factor, and PTC taste ability, and to compare them with the neighbouring populations. A total of 360 individuals (179 males and 181 females) from 68 families form the sample. Standard methods of Race and Sanger (1968) were followed for ABO blood groups, secretor factor, and Rh-factor, whereas the serial dilution technique of Harris and Kalmus (1949) were followed for ability to taste PTC.

It is seen from the examination of Table 1 that the frequency of blood group B is higher in males (48.05%) than in females (40.88%) and in the combined population (44.46%) followed by that of blood group O (31.36%). The *r* gene frequency (0.5600) is found to be highest. The frequency of secretors (84.72%) outweighs that of nonsecretors (15.28%). All the individuals have been found to be Rh-positive (100.00%). The gene frequencies of genes *Se* (0.6091) and *D* (1.00) have also been calculated as high. There is no statistically significant difference between the two sexes in the three genetic markers.

On associating ABO blood group with secretor factor (Table 2), it is found that the secretor fathers (44.32%), secretor male (38.46%) and female children (42.31%) have more tendency for the blood group B, whereas the secretor mothers (32.04%) tend to have blood group

O, as is also the case with nonsecretor mothers (9.71%). On the other hand, nonsecretor fathers (5.68% & 3.41%), female (8.97% & 1.28%) and male children (2.20% & 9.89%) have more tendency for blood groups A and B, respectively. The test of significance applied to the parents and children shows no statistically significant difference.

In comparison with Punjabis of Punjab (Sharra 1959), Khatri of Punjab & Kashmir (Malone and Lahiri 1927) statistically significant differences are found for ABO blood groups. As compared with Punjabis, Bahawalpuris show nonsignificant differences for secretor factor. Nonsignificant differences with Oraons of Chotta Nagpur (Kirk et al. 1962) but significant differences with Khatri and Brahmins of Punjab (Bhalla 1966), are then found with respect to Rh factor. The PTC antimode lies at Threshold Solution Number (TSN) 6, so that TSNs 1-6 are grouped as nontasters and TSNs 7-12 as tasters.

It is seen from Table 3 that the frequency of male (41.89%) and female (46.41%) tasters is less than the frequency of male (58.11%) and female (53.59%) nontasters. The test of significance reveals significant differences between the two sexes. The frequency of gene *t* (0.7452) is approximately three times greater than that of gene *T* (0.2548). The present population, when compared with Jats of Punjab & Delhi (Chattopadhyay 1970) and Punjabis of Delhi & Chandigarh (Sharma 1959) show highly significant differences.

Table 1. ABO blood groups, secretor factor and Rh-factor among the Bahawalpuris of Patiala

Sex	ABO blood groups ^a				Secretor factor ^b			Rh-factor ^c						
	N	A	B	O	AB	P	q	r	Sec.	Non-Sec.	Se	se	Rh+ve	D
M	179	21.23	48.05	25.69	5.03	0.1414	0.3151	0.5069	85.47	14.53	0.6188	0.3812	100.00	1.00
F	181	18.79	40.88	37.02	3.31	0.1175	0.2530	0.6085	83.97	16.03	0.5996	0.4004	100.00	1.00
M + F	360	20.01	44.46	31.36	4.17	0.1294	0.2833	0.5600	84.72	15.28	0.6091	0.3909	100.00	1.00

^a $\chi^2 = 5.774, 3 DF, 0.20 > P > 0.10$; ^b $\chi^2 = 0.298, 1 DF, 0.70 > P > 0.50$; ^c $\chi^2 = 0.005, 1 DF, 0.95 > P > 0.90$

Table 2. Association of ABO blood groups with secretor factor among Bahawalpuris of Patiala

Group	N	Secretors				Nonsecretors			
		A	B	O	AB	A	B	O	AB
Fathers	88	18.18	44.32	22.73	2.27	5.68	3.41	3.41	0.00
Mothers	103	15.53	31.07	32.04	3.88	0.97	6.80	9.71	0.00
Parents	191	16.75	37.17	27.75	3.14	3.14	5.25	6.80	0.00
Male Children	91	16.48	38.46	21.98	6.59	2.20	9.89	3.30	1.10
Female Children	78	14.10	42.31	26.92	2.57	8.97	1.28	3.85	0.00

$\chi^2 = 1.6923, 3 DF, 0.70 > P > 0.50.$

Table 3. Gene frequency distribution of PTC taste ability among Bahawalpuris of Patiala

Sex	N	Tasters (%)	Nontasters (%)	T	t
M	179	41.89	58.11	0.2377	0.7623
F	181	46.41	53.59	0.2679	0.7321
M + F	360	44.45	55.55	0.2548	0.7452

$$\chi^2 = 4.472, \quad 1 \text{ DF}, \quad 0.05 > P > 0.02$$

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REFERENCES

- Bhalla V. 1966. Blood group distribution pertaining to ABO, MNSs, Rh-Hr systems in Indian sub-continent. *The Anthropologist*, 4: 67.
- Chattopadhyay P.K. 1970. Taste sensitivity to PTC among the Jats. *Anthropol. Anz.*, 33: 52-60.
- Harris H., Kalmus H. 1949. The measurement of taste sensitivity to PTC. *Ann. Eugen.*, 15 (24).
- Kirk R.L., Lai L.Y.C., Vos G.H., Vidyarthi 1962. Genetic survey of Oraons of Chotta Nagpur. *Am. J. Phys. Anthropol.*, 20 (3).
- Malone R.H., Lahiri M.N. 1927. The distribution of blood groups in certain races and castes of India. *Indian J. Med. Res.*, 16.
- Race R.R., Sanger R. 1968. *Blood Groups in Man*. Oxford: Blackwell Scientific Publication.
- Sharma J.C. 1957. Inheritance of secretor factor and frequency distribution of secretor genes among Punjabis. *The Anthropologist*, 14: 44-49.
- Sharma J.C. 1959. Blood and PTC taste studies in Punjabis and the effect of age and certain eating habits. *The Anthropologist*, 6: 40.

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