

Serogenetic Variation Among the Dhobis of Tirupati, Andhra Pradesh

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ABSTRACT The present paper report the A₁, A₂, BO and Rh(D) blood groups variation among the two sub-castes of Dhobis namely Murikinati Dhobis (MND) and Reddibhumula Dhobis (RBD) in Tirupati town of Andhra Pradesh. The A₁, A₂, BO and Rh(D) blood groups reveal the homogeneous nature of the two groups with the highest proportion of 'O' group persons. The overall picture of ABO percentage in Murikinati Dhobis is O (49.63%) > A (29.85%) > B (16.04%) > AB (4.48%), where as, in Reddibhumula Dhobis it is O (45.68%) > B (26.77%) > A (21.65%) > AB (5.90%). The value of AA:OO ratio is found to be more in Reddibhumula Dhobis (1:9.05) and the value of BB:BO ratio is higher in Murikinati Dhobis (1:12.97). The Rh -ve frequency was found to be more among Murikinati Dhobis (5.2%) than Reddibhumula Dhobis (4.3%).

The ABO and Rh blood groups are the most significant genetic markers to determine the genetic variation within and between the populations. Hence an attempt is made in this paper to see the similarities and dissimilarities within and between the two endogamous sub-castes of the Dhobis, a backward population.

MATERIALS AND METHODS

The materials selected for the present study are the two sub-populations of Dhobis

(Washerman) namely Murikinati Dhobis (MND) and Reddibhumula Dhobis (RBD) inhabiting in Tirupati town of Chittoor district of Andhra Pradesh. The blood samples for the study of serogenetics were collected from 268 and 254 unrelated individuals from MND and RBD sub-groups respectively. Dhobis are economically poor and their main occupation being the washing of the clothes of their neighboring castes. Literacy rate is low. Nuclear family is more common. Polygamy is allowed. Endogamy is strictly followed. The blood samples were collected according to the methods of Race and Sanger (1962). The ABO alle frequencies were calculated according to Mourant et al (1976).

RESULTS AND DISCUSSION

The frequency distribution of the A₁, A₂, BO phenotypes with gene frequencies among MND and RBD are given in table 1. In both the sub-castes the 'O' group has the highest frequency (MND: 49.63%; RBD: 45.68%) and 'AB' has the lowest frequency (MND: 4.48%; RBD: 5.90%). The 'A' phenotypes percentage is more in MND (29.86%) than RBD (21.65%). Whereas, the frequency of 'B' is more in RBD

Table 1: Distribution of A₁, A₂, BO phenotypes and allele frequencies among Dhobis

Phenotypes	Murikinati Dhobis (MND)			Reddibhumula Dhobis (RBD)		
	Observed number	Expected number	Allele frequency	Observed number	Expected number	Allele frequency
A ₁	61(22.76)	61.78	A ₁ = 0.1403	39 (15.35)	38.87	A ₁ = 0.0992
A ₂	19 (7.09)	19.13	A ₂ = 0.0491	16 (6.30)	17.46	A ₂ = 0.0493
B	43 (16.04)	43.92	B = 0.1083	68 (26.77)	69.32	B = 0.1791
O	133 (49.63)	132.18	O = 0.7023	116 (45.68)	114.84	O = 0.6724
A ₁ B	9 (3.96)	8.14		9 (3.54)	9.02	
A ₂ B	3 (1.12)	2.85		6 (2.36)	4.49	
Total	268	268.00	1.0000	254	254.00	1.0000
	D/σ = 0.3577 χ ² = 0.1338			D/σ = 0.4793 χ ² = 0.6672		

(26.77%) than MND (16.04%). The decreasing order of allele frequency in MND is O ($r: 0.7023$) $> A_1$ ($p_1: 0.1403$) $> B$ ($q: 0.1083$) $> A_2$ ($p_2: 0.0491$), but in RBD the order is O ($r: 0.6724$) $> A_1$ ($p_1: 0.0992$) $> B$ ($q: 0.1791$) $> A_2$ ($p_2: 0.0493$). The significant χ^2 value (11.46) between MND and RBD suggests the difference in intergroup homogeneity in phenotypic frequencies.

The frequency distribution of homozygosity and heterozygosity are given in table 2. The percentage of homozygosity for blood group 'A'

whereas, in RBD group it occurs in reverse manner revealing the higher incidence of heterozygous BO than AO.

The frequency distribution of Rh(d) phenotypes and their gene frequencies among the MND and RBD are given in the table 3. The MND shows higher frequency of Rh -ve phenotypes (5.22%) than RBD (4.33%). The gene frequency of recessive 'd' allele is found to be higher among the MND (0.2285) than the RBD (0.2081). The chi-square value reveals that the

Table 2: Percentage distribution of Homo and Heterozygosity for ABO phenotypes among Dhobis

Population	Number tested	Percentage of Homo and Heterozygotes					
		A blood group			B blood group		
		AA	AO	AA:AO Ratio	BB	BO	BB:BO Ratio
MND	268	3.58	26.60	1:7.05	1.17	15.21	1:12.97
RBD	254	2.20	19.97	1:9.05	3.21	24.08	1:7.51

Table 3: Distribution of Rh(D) phenotypes and allele frequencies among Dhobis

Phenotypes	Murikinati Dhobis (MND)			Reddibhumula Dhobis (RBD)		
	No	%	Allele frequency	No	%	Allele Frequency
Rh + ve	254	94.78	$D= 0.7715$	243	95.64	$D= 0.7919$
Rh - ve	14	5.22	$d= 0.2285$	11	4.33	$d= 0.2081$
Total	268	100.00	1.0000	254	100.00	1.0000

is relatively higher in MND (3.58%) than RBD (2.20). Likewise the heterozygosity incidence for 'A' group is also higher in the former group (26.60%) than the latter group (19.97%). The value of AA:BO is found to be higher in the RBD (1:9.05) than in the MND (1:7.42). The homozygosity and heterozygosity for blood group 'B' is relatively higher in RBD (3.21% and 24.08%) than MND (1.17% and 15.21%). The value of BB:BO is higher among the MND (1:12.97) and low in RBD (1:7.51). In MND population the incidence of heterozygous AO than BO is more,

difference in the distribution of Rh(D) phenotypes is insignificant ($\chi^2 = 0.23$). It shows greater homogeneity between the two endogamous subgroups of Dhobis.

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