

A Genetic Study on The Dalu of Meghalaya

P. Borthakur, Sarthak Sengupta and A.K. Ghosh

Department of Anthropology, North Eastern Hill University, Shillong 793 014, Meghalaya, India

KEYWORDS Dalu, Biological Affinity, Ethno-historic Background.

ABSTRACT The present genetic study was conducted among the Dalu individuals of Meghalaya. The genetic traits reported here include ABO blood groups, Rh factor, PTC taste sensitivity and colour blindness. The present findings have been compared with the neighbouring populations.

INTRODUCTION

The Dalu is a numerically small (approximately 8000 odd souls only), endogamous population of Meghalaya, which is anthropologically least known. They traced back their origin to the state of Manipur. It is believed that they migrated to the West Garo Hills under the leadership of a warrior named Dhalji, to whom the community also owes its identity of being called as 'Dalu'. The village, where Dhalji settled first, even now is referred to as Quillapara (or Dalu Quilla). At present majority of the Dalu is distributed in Nowgong (Barapathar) of Assam and Quillapara and Dalupara of West Garo Hills, Meghalaya. They are also scattered in Phulbari, Garobandha, Chakpolgiri, Araimile within the Dalu block of Williamnagar, Garo hills.

In the present note an attempt has been made to describe the genetic characteristics of the Dalu with a view to examining ethnic affinities between the Dalu and their neighbouring Mongoloid populations as well some other population groups of Manipur from where they claim to have migrated long back.

MATERIAL AND METHOD

A sample of 145 individuals (64 male, 81 female) were collected from Quillapara, Baranapara, Choipani and Duttapara in West Garo Hills district of Meghalaya by one of us (P.B.).

Data on some genetical traits - ABO blood groups, Rh factor and PTC taste sensitivity were collected from both sexes and data on colour blindness were collected from 129 male subjects. The individuals in the sample were mostly unrelated ones. In the present study all standard techniques (Lawler and Lawler, 1951; Harris and Kalmus, 1949; Ishihara, 1972) were followed.

RESULTS AND DISCUSSION

For ABO blood groups it is seen from table 1 that among the Dalu the frequencies of both O and B blood groups are almost same, and they are more than the frequency of A blood group. The chi-square value (3.318, d.f. = 1, >0.05) shows that the population is in equilibrium in respect of the trait. The value of D/σ (± 1.7961) also indicates equilibrium at this locus.

Among the Dalu phenotype B is more frequent than A (Table 1). The similar trend is also noted in the Garo (Mazumdar, 1950; Deka,

Table 1 : Genetic markers among the Dalu of Meghalaya

Genetic Marker	No. Tested	Phenotype	Frequency		Allele Frequency	
			No.	Per cent		
ABO	145	O	52	35.86	O	0.5774
		A	25	17.24	A	0.1550
		B	51	35.17	B	0.2676
		AB	17	11.72		
$D/\sigma = \pm 1.7961$						
Rhesus	145	Rh+	143	98.62	D	0.8825
		Rh-	2	1.38	d	0.1175
Tasting Ability to PTC						
Male	54	Taster		77.78	T	0.5286
		Non-taster		22.22	t	0.4714
Female	78	Taster		85.90	T	0.6245
		Non-taster		14.10	t	0.3755
M+F	132	Taster		82.58	T	0.5826
		Non-taster		17.42	t	0.4174
Colour blindness						
Male	129	Normal		100.00		

1978). It is however, in agreement with the general distribution pattern of ABO allele frequencies in the Indid (mostly castes) populations of North East India, but they stand apart from the other populations in respect of this trait. The chi-square values show that the Dalu stand significantly apart from both the Meitei (Chakravarty, 1986) and the Kabui (Chakravarty, 1986; Singh, 1986) of Manipur as well as from all Khasi sub-populations (Macfarlane, 1941; Miki et al., 1960; Das, 1969; Flatz et al., 1972), including the Lyngam (Ahmed et al., 1997). But no significant difference in ABO blood groups is observed between the Dalu and Garo (Mazumdar, 1950; Deka, 1978). It may be mentioned that in respect of ABO blood groups, the Dalu ($A=0.1550$, $B=0.2676$, $O=0.5774$) stand at a distance from the Indian average (Ghosh, 1969; $A=0.1834$, $B=0.2258$, $O=0.5908$; Bhasin et al., 1994; $A=0.186$, $B=0.233$, $O=0.581$), Himalayan population (Bhasin et al., 1994; $A=0.211$, $B=0.222$, $O=0.567$), Eastern Himalayan population (Bhasin et al., 1994, $A=0.206$, $B=0.197$, $O=0.598$) and also from the World average (McArthur and Penrose, 1949; $A=0.2150$, $B=0.1620$, $O=0.6320$).

In the present study only 1.38% of the sample are Rh-. However, the chi-square value (1.602, d.f. = 1, >0.05) shows that the population is in equilibrium in respect of Rh blood group. The frequency of *d* is found to be 0.1175 in the Dalu. So far this trait is concerned, the Dalu (0.1175) resemble the Meitei (0.0985, Chakravarty, 1986) and Lyngam (0.1292, Ahmed et al., 1997) as well as some neighbouring Mongoloid populations like the Khasi (Bhattacharjee, 1957; Miki et al., 1960), Garo (Deka, 1984) in which Rh negative is almost absent. In Himalayan population ($d=0.153$; Bhasin et al., 1994) as well as people of Eastern Himalaya also ($d=0.062$; Bhasin et al., 1994) frequency of '*d*' is very low. The Indian average (Bhasin et al., 1994) with regard to frequency of '*d*' is 0.197.

The bimodal distribution of threshold value shows that the frequencies of taster and non-

taster among the Dalu are 82.58% and 17.42%, respectively (Table 1) with the antimode lies between 3 and 4. The frequency of non-taster gene is found to be 0.4174 in the Dalu. However, the frequency of non-taster is higher in the Lyngam (30.00%, Ahmed et al., 1997), Garo (21.60%, Deka, 1984), Bhoi Khasi (21.90%, Das, 1976) and Khasi sample (21.77%) reported by Miki et al. (1960). On the otherhand this frequency is lower in the Khyriem Khasi (10.33%, Jaswal, 1981; 11.26%, Das, 1976), War Khasi (12.29%, Das, 1976), Meitei (13.65%, Chakravarty, 1986) and Kabui (14.56%, Chakravarty, 1986). The Dalu (17.42%) show almost an intermediate value and resemble the Pnar Khasi (17.06%, Das, 1976) in this respect.

It may be noted the the low incidence of non-taster is a characteristic feature of all Mongoloid populations of North East India, and on the whole all these populations are within the range, reported for Mongoloid populations of this region by Sengupta (1989). The chi-square value show that in respect of this trait the Dalu do not differ significantly from the Khyriem (Das, 1976; $\chi^2=2.68$), Pnar ($\chi^2=0.01$), War ($\chi^2=1.84$), Bhoi ($\chi^2=1.01$), Khasi (Miki et al., 1960; $\chi^2=1.08$), Garo ($\chi^2=0.71$), Meitei ($\chi^2=0.99$) and Kabui ($\chi^2=0.55$). But they differ significantly from the Khyriem (Jaswal, 1981; $\chi^2=4.21$) and the Lyngam ($\chi^2=5.54$).

A total of 129 male individuals are tested for colour blindness. It may be noted that among the Dalu not a single case of colour blind individual has been detected. But colour blindness is quite frequent among the Meitei (4.50%, Chakravarty, 1986; 8.60%, Singh, 1977), Kabui (4.96%, Singh, 1977), Garo (4.90%, Rizvi, 1974), Hajong (3.80%, Barua, 1985) and Khasi samples (3.80%, Mukherjee, 1963; 7.35%, Rizvi, 1974).

Considering the present findings on all these four genetic markers, it may be said that the Dalu seem to be a distinctly different population, and it do not resemble any of the Mongoloid populations of Meghalaya and Manipur,

though in respect of Rh blood group and PTC, the Dalu show some resemblance with some Mongoloid groups. However, to understand the phylogenetic relationship of the Dalu with other neighbouring populations we shall have to take up some additional detailed studies on other genetic markers.

REFERENCES

- Barua, S. : Red green colour blindness and earlobe attachment among the Hajong of Meghalaya. *Human Science*, **38** : 118-123 (1985).
- Bhasin, M.K., Walter, H. and Danker-Hopfe, H. : *People of India : An Investigation of Biological Variability in Ecological, Ethno-economic and Linguistic Groups*. Kamla-Raj Enterprise, Delhi (1994).
- Bhattacharjee, P.N. : Some genetical study of the Khasi and their genetic relationship. *East. Anthropol.*, **28** : 171-177 (1975).
- Chakravarty, R. : *People of Manipur*, B.R. Publishing Corporation, Delhi (1986).
- Das, B.M. : Blood groups in tribal population of North East India with special reference to the Khasi. *Anthropologist, Special Volume* : 85-92 (1968).
- Das, B.M. : Taste sensitivity to phenylthiourea among the Khasi of North East India. pp. 193-203, *Proc. Int. Symp. Hum. Genet.* M.R. Chakravarti (Ed.), Andhra University, Waltair (1976).
- Deka, R. : A genetic survey in four mongoloid populations of the Garo Hills, India. *Anthrop. Anz.*, **42** : 41-45 (1984).
- Ghosh, A.K. : ABO blood group frequencies of India, Pakistan and the adjoining areas as a whole. *Man in India*, **49** : 372-377 (1969).
- Harris, H. and Kalmus, H. : The measurement of taste sensitivity to PTC. *Ann. Eugen.*, **15** : 24-31 (1949).
- Ishihara, S. : *Tests for Colour Blindness*. Kanehara Shuppan, Tokyo (1972).
- Jawal, I.J.S. : Taste sensitivity to phenylthiourea among Khyntiem Khasi of Meghalaya, *Indian Anthropologist*, **11** : 125-130 (1981).
- Lawler, S.D. and Lawler, L.J. : *Human Blood Groups and Inheritance*. William Heinemann Ltd., London (1951).
- McArthur, N. and Penrose, L.S. : World frequencies of the O, A and B blood group genes. *Ann. Eug.*, **15** : 302-305 (1949).
- Miki, T., Tanaka, T. and Furuhashi, T. : On the distribution of ABO blood groups and the taste ability to phenylthiocarbamide (PTC) of the Lepchas and Khasis. *Proc. Jap. Acad.*, **36** : 76-80 (1960).
- Mukherjee, D.P. : Variation in defectiver colour vision among some tribes of Assam. *Bull. Anthropol. Surv. India*, **12** : 39-42 (1963).
- Sengupta, S. : Taste sensitivity among the Koch population of Assam. *Social Sciences*, **2** : 112-117 (1989).
- Singh, K.S. : Variation in colour blindness among three populations of Manipur. *Anthropologist*, **24** : 36-39 (1977).