

## Genetic Study Among the Digaru Mishmis of Arunachal Pradesh

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### INTRODUCTION

The Digaru Mishmi is a scheduled tribe of Arunachal Pradesh, under the greater fold of the Mishmi group. They are popularly known as Taraon. The community is concentrated in the Hayuliang, Changlagam and Goiliang circles of the Lohit district. They are engaged in *jhum* cultivation. They are adept at weaving, basketry and cloth embroidery and expert in making bamboo baskets and cane furniture with beautiful designs. The clothes are woven with many attractive and colourful designs. In the present note an attempt has been made to study the distribution of ABO and Rh (D) blood group, PTC taste sensitivity and colour blindness. The present data have also been compared with other tribes of Arunachal Pradesh.

### MATERIAL AND METHOD

Samples from 143 unrelated Digaru Mishmi (male = 92, female = 51) were collected from Hayuliang circles of Lohit district. Blood samples were analysed for the ABO and Rh (D) blood groups using standard antisera with adequate controls. The gene frequencies were calculated after Mouton et al. (1976). The shorting technique by serial dilution method of Harris and Kalmus (1949) was employed to determine the taste threshold of individuals. The classification of individuals into tasters and non-tasters were done after determining the antimode of taste thresholds. The red-green colour blindness tested only among males using Ishihara's (1959) plates during day time.

### RESULTS AND DISCUSSION

Table 1 shows the ABO blood group phenotypes and allele frequencies among the Digaru Mishmi population. It is found that the frequencies of A blood group phenotype is higher than that of B. The frequencies of *A*, *B*, and *O* are 0.1942, 0.1119 and 0.6939, respectively. The test of goodness of fit indicates that this population is in genetic equilibrium in respect of this

trait. It is seen that the frequency of *A* allele is higher than that of *B* allele not only in Digaru Mishmi, but the same is true for most of the population groups of Arunachal Pradesh such as Gallong (Kumar, 1954), Minyong, Padam, Pasi, Pangi (Bhattacharya, 1954), Nocte (Bhattacharya, 1957), Wancho (Naug, c.f. Das, 1969), Sulung (Duarah, 1980), Adi (Kar, 1978-79), Dirang and Kalaktang Monpa (Duarah, 1990), Taraon Mishmi (Duarah, 1979), on the other hand, Tawang Monpa (Duarah, 1990) show the higher *q* gene frequency (see Sengupta, 1983; Bhasin et al., 1992 for details).

The frequency of Rh (d) blood group in the Digaru Mishmi is absent and more or less corroborate with the earlier findings which noted that Rh negative allele is either absent or present in a very low frequency among the Mongoloid populations of North East India.

The frequencies of colour blindness in Digaru Mishmi males (6.52%) are intermediate of the range of variation among the Mongoloid tribes of Arunachal Pradesh (ranges from 0.88% to 10.40%). The protan: deutan ratio (2 : 1) is also quite high in them. The red-green colour blindness incidence in Digaru Mishmi appears to be nearly as high as that in Khampti (6.54%) and Tangsa (5.51%) tribe of Arunachal Pradesh. However, among the other tribal groups like Idu Mishmi (4.59%), Digaru Mishmi (4.35%, Choudhury 1977), Gallong (4.27%, Jaswal 1978), Padam Minyong (3.17%), Wancho (2.78%), Dirang Monpa (2.73%), Khalaktang Monpa (1.79%), Tagin (1.35%), Gallong (1.09%, Das and Choudhury, 1976) and Tawang Monpa (0.88%), the incidence of the abnormality gradually declines. The Apatani tribe stand far apart from all with a considerable high frequency of 10.40% of colour blind and the incidence is the highest in North East India.

The males of Digaru Mishmi (28.26%) exhibit higher percentage of non-taster than their female counterparts (26.57%). The Monpa males of Klalaktang region have the maximum non-taster phenotype (30.56%) and the minimum is found in Aka / Hrusso population (3.79%). Studies conducted earlier in this regard

**Table 1: Genetic markers among the Digaru Mishmi**

Genetic Markers	No.	Phenotype	Frequency	Allele Frequency
ABO Blood Groups	143	A	30.77	$A = 0.1942$
		B	16.78	$B = 0.1119$
		AB	4.20	$O = 0.6939$
		O	48.25	$\chi^2 = 0.015, p > 0.05$
Rh blood Group	143	Rh (+)	100.00	$D = 1.00$
		Rh (-)	-	$d = 0$
PTC taste sensitivity	Male = 92	Taster	71.74	$T = 0.4684$
		Non-taster	28.26	$t = 0.5316$
	Female = 51	Taster	73.43	$T = 0.5149$
		Non-taster	26.57	$t = 0.4851$
Colour blindness	Male = 92	Colourblindness	6.52	
		Protan	4.35	
		Deutan	2.17	

(Goswami and Das, 1990) reveal that the Digaru along with all the sub-groups of Monpas (for eg. Dirang Monpa = 29.50% ; Tawang Monpa = 25.33%) deviate from the general trend of low incidence of non-taster gene among other Mongoloid tribes of Arunachal Pradesh like Singpho (19.86%), Khmpti (18.47%), Khowa (17.21%), Miju Mishmi (15.26%), Tangsa (15.12%), Sherdukpen (12.63%), Hill Miri (12.39%) Wancho (11.29%), Tagin (11.05%), Idu Mishmi (10.29%), Apatani-Guchi (10.00%), Minyong (8.28%), Apatani – Guth (6.84%), Nishi (6.71%), Gallong (6.09%) and Miji (5.47%) where the incidence of non-taster is much lower.

### ACKNOWLEDGEMENT

The authors express their gratitude to the Director, Anthropological Survey of India for giving them the opportunity to work in Arunachal Pradesh.

**KEY WORDS** Genetic Markers. Variation. Tribes. Arunachal Pradesh.

**ABSTRACT** The present note reports the distribution of ABO, Rh (D), PTC taste sensitivity and red-green colour blindness among the Digaru Mishmis of Arunachal Pradesh.

### REFERENCES

- Bhasin, M.K., Walter, H. and Danker-Hopfe, H.: *The Distribution of Genetical, Morphological and Behavioural Traits Among the Peoples of Indian Region*. Kamla-Raj Enterprises, Delhi (1992)
- Bhattacharjee, P.N.: Blood group investigations in the Abor (Adi) tribe. *Bull. Dept. Anthropol. Govt. of India*, **3** (1): 51-54 (1954).
- Bhattacharjee, P.N.: A study on ABO, MN blood groups and the ABH secretion in the Nocte in the NEFA. *Bull. Dept. Anthropol. Govt. of India*, **6**(1): 77-80 (1957).
- Balakrishnan, V.: Hardy-Weinberg equilibrium and allele frequency estimation; pp 39 – 93, In: *Statistical Methods in Human Population Genetics*. K.C.Malhotra, (Ed.). IBRAD, Indian Statistical Institute and Indian Society of Human Genetics, Calcutta (1988).
- Choudhury, B. and Das, P.B.: Frequency of colour blindness in some populations of Arunachal Pradesh. *Jr. Gau. Univ.*, **25**: 23-25 (1974).
- Choudhury, B.: Colour blindness among the three tribes of Lohit district, Arunachal Pradesh. *Bulletin of the Department of Anthropology Dibrugarh University*, **6**: 204-208 (1978).
- Das, P.B. and Choudhury, B.: Hand clasping, arm folding, earlobe attachment and colour blindness among the Gallong of Arunachal Pradesh. *Bulletin of the Department of Anthropology, Gauhati University*, **4**: 65-70 (1975).
- Duarah, D.K. and Das, P.B.: A study of some genetic traits of Tagins of Arunachal Pradesh. *Resarun*, **4**(2): 39-47 (1978).
- Duarah, D.K.: Distribution of ABO, MN, Rh blood groups among the Mishmis (Taraons) of Lohit, Arunachal Pradesh. *Resarun*, **5**(2): 22-28 (1979).
- Duarah, D.K.: A study on ABO blood groups and some genetic traits of the Sulung of Subansiri district, Arunachal Pradesh. *Resarun*, **6**(2): 19-29 (1980).
- Duarah, D.K.: *The Monpas of Arunachal Pradesh*, Directorate of Research, Arunachal Pradesh, Itanagar (1990).
- Goswami, M.C. and Das, P.B.: *The People of Arunachal Pradesh: A Physical Survey*. Directorate of Research, Govt. of Arunachal Pradesh, Itanagar (1990).
- Harris, H. and Kalmus, K.: The measurement of taste sensitivity to PTC. *Annals of Eugenics*, **15**:24-31 (1949).
- Ishihara, S.: *Tests For Colour Blindness*. Kannehara Shuppan Co. Ltd., Tokyo (1959).
- Jaswal, I.J.S.: Anomalous colour vision among the three tribes of Arunachal Pradesh, India. *Anthropologist*, **22**: 53-59 (1978).

- Kar, R.K.: The Rh blood group among the Adi of Pasighat, Arunachal Pradesh. *Eastern Anthropologists*, **28 (2)**: 165-168 (1975).
- Kumar, N. : Blood group and secretor frequency among the Gallong. *Bulletin of the Department of Anthropology*, **4**: 5-70 (1975).
- Kumar, N.: Taste, Mid phalangeal hair and occipital hair whorls among the Nocte Nagas. *Bulletin of the Department of Anthropology*, **4**: 61-67 (1955).
- Mourant, A.E., Kopec, A.C. and Sobeck, K.D.: *The Distribution of the Human Blood Groups and Other Polymorphisms*. Oxford University Press, London (1976).
- Sengupta, S.: ABO blood frequency in North East India. *Journal of Indian Medical Association*, **80 (9-10)**: 137-139 (1983).
- Srivastava, R.P.: Taste sensitivity to PTC in two groups of NEFA Tribes. *Man In India*. **51( 3)** : 241-244 (1971).

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