

## Distribution of the MN Blood Groups in Kumaon, Uttar Pradesh, India

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**ABSTRACT** Baseline data are presented on the phenotype and allele frequency distribution of the MN blood groups in two major endogamous caste groups (Brahmin and Rajput) inhabiting Kumaon region of the Uttar Pradesh Himalayas.

Rajput) were drawn from both sexes and collected in potassium EDTA. Whole blood samples were typed using rabbit anti-M and anti-N (Ortho Diagnostic Systems Inc., N.J.) by slide test. Agglutination occurred within 30-60 seconds, albeit negative results were recorded only after 2 minutes.

### INTRODUCTION

Enquiries into the genetic make up of the hill peoples of Kumaon began as early as 1941, when during Census serological survey was also conducted in the United Provinces (Majumdar and Kishen, 1947). However, during the last over five decades only a handful of studies mostly relating to the ABO (Tiwari, 1952, 1954; Bird and Krishnaswamy, 1955; Bhasin, 1964; Kumar, 1968; Tiwari and Kapoor, 1982) and occasionally also to the MN and Rh (Srivastava, 1965; Tiwari and Kapoor, 1982) blood groups were undertaken. In fact, there is paucity of genetic data on the contemporary populations of Kumaon, and it is therefore that the present study on the distribution of the MN blood groups in two major endogamous caste groups of the region viz. the Brahmin and Rajput was planned.

### MATERIAL AND METHODS

The present serological investigation was carried out in the Nainital district of Kumaon division of Uttar Pradesh. The subjects were local students attending Government Inter Colleges at Bhowali and Bhimtal and Government Girls Inter College at Bhimtal. Finger prick blood samples from a total of 317 not closely related subjects (192 Brahmin and 125

### RESULTS AND DISCUSSION

The distribution of the MN blood groups in the present caste material from Kumaon is presented in table 1. There is good agreement between the observed and expected phenotype numbers, the differences being statistically non-significant for both groups studied. The frequency of the *M* allele was recorded higher in Rajput (0.668) than in Brahmin (0.591). However, there was no evidence of any appreciable inter-group heterogeneity between them ( $\chi^2 = 4.028$ , d.f. = 2,  $0.20 > p > 0.10$ ).

Two available earlier studies from the Kumaon region have reported the incidence of the *M* allele varying from 0.599 in Johari Bhotia of Pithoragarh district (Tiwari and Kapoor, 1982) to 0.753 in Rana Tharu of Nainital district (Srivastava, 1965). Apparently, the range of the allele in the present caste material (0.591-0.668) and that recorded in the earlier tribal material of this region (0.599-0.753) are somewhat similar.

Interestingly, there is a close similarity in the *M* allele frequency between the present Rajput sample from Nainital district (0.668) and that reported for Rajput of neighbouring Garhwal (0.660; Tiwari and Bhasin, 1968). Similarly, the frequency observed in the pres-

Table 1. Phenotypes and allele frequencies of the MN blood groups in the Brahmin and Rajput of Nainital district

| Population group | n   |      | Phenotypes |       |       | Allele frequencies |       | $\chi^2$<br>(d.f. = 2) |
|------------------|-----|------|------------|-------|-------|--------------------|-------|------------------------|
|                  |     |      | M          | MN    | N     | M                  | N     |                        |
| Brahmin          | 192 | Obs. | 66         | 95    | 31    | 0.591              | 0.409 | 0.107                  |
|                  |     | Exp. | 67.06      | 92.82 | 32.12 |                    |       |                        |
| Rajput           | 125 | Obs. | 54         | 59    | 12    | 0.668              | 0.332 | 0.310                  |
|                  |     | Exp. | 55.78      | 55.44 | 13.78 |                    |       |                        |

ent Brahmin sample (0.591) was found to be closer to that of their counterpart studied from Garhwal (0.616; Tiwari and Bhasin, 1968). Thus, this serological study suggests close genetic affinities between the respective caste groups inhabiting the adjoining hilly areas of Kumaon and Garhwal Himalayas.

The conclusions of this study are based on results from a single blood group system. However, to appreciate fully the genetic variation in contemporary hill peoples of Kumaon, further studies utilizing data from additional serological as well as biochemical markers are required.

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