

5 SUMMARY

The present investigation covers exclusively the Mongolian origin races including generally hill inhabiting the Hill Tribes, the Kirati Complex, and the Rajbangsis of plains of North Bengal and adjoining areas. A cytogenetic investigation has been carried out on the constitutive heterochromatin polymorphism involving chromosomes 1, 9 and 16 and the variability of length in the Y chromosome in the normal population extending from the plains to an altitude of 8500 ft and above. The observation reveals a wide diversity in size and position of C-heterochromatin in the different Mongolian races. No general correlation could be noted between the frequency of C-band variants and that of individuals carrying polymorphism. The frequency of C-variant in chromosomes 1, 9 and 16 reveal a wide percent variation within and between the races. Another facet of C-heterochromatin polymorphism is the variability of C-band level categories. A close similarity has been noted between the Hill Tribes and the Kirati Complex in regard to the percent occurrence of levels 3 and 4 types.

A comparative analysis of the frequency of increased and decreased heterochromatin material in different Mongolian races shows a tendency towards increase in the size of C-bands in the Hill Tribes and the Kirati Complex, while, a reverse situation has been noted in the Rajbangsis. The frequency of C-band size polymorphism in individual chromosomes depicts a wide percent variation between the racial groups. C-band polymorphism varies significantly between the Mongolian races living under different ecological/climato-geographical conditions, thus demonstrating interracial heterogeneity of C-band.

The present study reveals the absence of C-heterochromatin inversion in chromosome 16 as well as the total inversion in chromosome 1 in the population studied. Total inversion of chromosome 9 occurs at a low frequency in the Hill Tribes and the Kirati Complex. By and large, partial inversions of chromosomes 1 and 9 are less frequent in the Rajbangsis. A high frequency of C-band homozygous polymorphism as well as a relatively high percentage of heterozygous polymorphism have been observed in the high altitude dwellers. Heterozygous deficiency of C-heterochromatin involving chromosome 1 has been noted in a Rajbangsis.

The present investigation also indicates a wide variability in the length of Y chromosome between the populations of Mongolian origin. Long Y chromosome is most frequent in the Kirati Complex and the Hill Tribes.

The significant increase in the amount of C-heterochromatin as well as a relatively high frequency of C-band size and position variants in the hill populations living at high altitude with low temperature suggest the possible selective value of chromosomal C-heterochromatin material in the adaptation of human population to extreme environmental factors. Variability in the degree of tolerance of the genome for changes involving heterochromatin has been noted between different Mongolian origin groups. The Hill populations, by and large, living at high altitude belts with low temperature are more tolerant to C-band variability with no apparent deleterious effect on the phenotype.