

Genetic Structure of Daic As Revealed By Y Chromosomes

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Y-chromosome polymorphisms are powerful tools in delineating the genetic structure of human populations. A large number of populations in China have been studied in the last several years and 17 Y-chromosome SNP haplotypes have been found in them, some of which are specific to East Asians. More interestingly, major ethnic groups tend to have their own characteristic profiles reflected by their respective Y haplotype distribution. Daic, an ethnic group dispersing from Assam to Taiwan is a diverse group and yet its genetic structure shows a distinctive profile, different from those of the other groups in East and Southeast Asia, although some resemblance between Austronesian, especially Taiwan Aborigines, is noticeable.

The distribution of Y-chromosome SNP haplotypes in 30 Daic populations were studied. Among the 19 SNPs studied, M119, M110, M95, and M88 are most informative in delineating the genetic structure of Daic. Linguistic and cultural classification are in general concordance with the genetic classification although it may be transgressed due to the apparent gene flow between the major branches of Daic. For example, some populations of Kadai, a major branch of Daic, are more similar to the populations Kam-Sui, another major branch. This phenomenon may be resulted from the unitary self-identification and geographic assimilation of Daic system. The geographic distribution of the three principal components (PCs) were generated by superimposing the loading coefficients of each population onto a map, respectively. The distribution first PC suggested a possible single origin of all the Daic populations. The second PC indicated a deep division of the Daics into two: east group and west group. The center of the east group is in Zhejiang China, and that of the west one is on the border between China and Myanmar. The third PC implies the migration routes southern China towards northeast, northwest and southwest during the relocation of Daic populations. The gene flow between Daic and populations of other ethnic groups are noticeable. Interestingly, Han Chinese in Zhejiang and Shanghai has a highest concentration of Daic types of Y haplotypes among all the Han populations in China, suggesting a possible expansion of Daic people from southern China to Zhejiang via Kiangsi. Daic in Zhejiang and Fujian might have come from different routes, as suggested by the difference of their profiles. A diphyletic genetic structure were found in Taiwan Aborigines. The West Daic, Tai, Thai, Ahom, etc. emigrated from southern China rather late. It might happen one to two thousand years ago.