

Poster Session II: Genomic Sequence and Diversity

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Evolution, Inheritance and Gene-Localization of Interdigital Patterns

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Dermatoglyphy is a character peculiar to primates. Interdigital patterns (IDPs) are the most representative dermatoglyphies. At beginning of the primates' evolution pathway, there are several unconnected muscle pads with patterns in each interdigital area. Latter primates keep only one pad in each area, but they have kept different pads, which suggest they departed quite early. The habit of ground-inhabited makes the patterns indifferent areas develop equally, while tree-inhabited unequally. Pattern intensity is direct ratio to the rate of utilization of interdigital areas. So Old World monkeys' IDPs are most developed and those of apes' are most retrograde. Humankind has secondary developed a kind of various pattern in the palm area opposite to the third finger for labor. The types of this pattern on one hand can be clustered into 4 lots by curve and merge transformations. They are 4 combinations of 2 states (pattern or no pattern) in area III and IV. Pedigree analysis shows that pattern genes controlling area III or IV are mosaic dominant, and the corresponding area patterns on left and right hands are controlled by the same allele. Some of these alleles express symmetric patterns, while others express asymmetric patterns. This is the major gene locus of IDP. There are still loci of a kind of original patterns inherited from human-like apes, on which the pattern genes are recessive. So IDP fit a left-right asymmetric, mosaic dominant, major gene inheritance model. The study of IDP may inspire the studies of other left-right asymmetric characters such as brain, hand habit, *etc.* The linkage relationship between IDP and phenylthiocarbamide (PTC) tasting is found in our pedigrees($r=0.113$). The gene of PTC tasting is considered on chromosome 7q, so the gene of IDP may be on a locus nearby. Whole genome scan with 304 short tandem repeat polymorphism (STRP) markers throughout 23 chromosomes has been done in 223 individuals of 11 pedigrees. The linkage between these STRP markers and IDP has been tested. D7S821 is found tightly linked with IDP genotype. Thus, IDP gene is initially localized near 109.12 cM of chr.7.

KEY WORDS: Interdigital patterns (IDPs) , Evolution , Inheritance, Gene-Localization