

Varietal Differences and Geographical Distribution of Rice Varieties in Yunnan Province Based on the Esterase Isozymic Loci

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In order to clarify the extent of genetic diversity of cultivated rice varieties in the Yunnan province and to classify them into varietal groups, isozymic polymorphism of esterases was analyzed. Nine alleles out of the four loci which were already analyzed for their genetic behavior and Band 2A were traced as the markers, namely, *Est-1*, *Est-2*, *Est-3*, and *Est-4* has 2, 3, 2, and 2 alleles, respectively.

1) Indigenous varieties of Yunnan province displayed all kinds of allelic variations and carried a new allele relating to Band 2A, hence the province was generally recognized to show wide allelic variations.

2) After the province was divided into seven regions based on the climatic and ecological conditions, the relationships between the regions for the gene frequencies of the loci were compared. The number of alleles in the southern regions was larger than that in the northern regions.

3) Genotype frequencies combined with the four loci, which amount theoretically to 24 combinations, were calculated in each region. The largest diversity of the genotype was observed in the southernmost regions in the vicinity of Laos and Burma, and no dominant varietal groups were noted in these regions. A geographical cline was clearly demonstrated for some of the genotype frequencies. Namely, after the degree of diversity exhibited the maximum level in the southernmost regions, it decreased toward the North and only a few genotypes were observed in the northernmost regions.

4) The above results indicate that the center of genetic diversity of Asian cultivated rice varieties includes the southern part of Yunnan province as reported in previous studies. The classification of cultivated rice in Yunnan province, requires further studies in relation to the genetic constitution of esterase isozyme genes.