INHERITANCE AND LINKAGE RELATIONSHIPS OF A
CHLOROPHYLL MUTATION IN RICE

N. E. Jodon

A VIRESCENT white-stripe chlorophyll deficiency in rice plants was found in 1933 in a heterozygous condition in an F₁ selection from a Kameji × Blue Rose cross. The emerging seedlings were nearly white with indefinitely bordered linear areas of chlorophyll. New leaves and emerging panicles also were deficient in chlorophyll. Counts made on segregating progeny in subsequent generations indicated that the inheritance of the virescent character was determined by a single recessive factor. It was noted also that the rate of development of chlorophyll varied from season to season, and that virescent plants tended to be smaller than normal plants.

The present paper reports the mode of inheritance and linkage relations of five character pairs in rice, viz., normal vs. virescent, clustered vs. normal floret arrangement, common vs. glutinous kernels, purple vs. colorless apiculus, and late vs. early maturity, in a cross between C. I. 4630 with strain No. 2912A21 breeding true for virescent seedlings and late maturity.

LITERATURE REVIEW

The literature on rice genetics originates from widely scattered sources and in some instances it is not possible to be certain of the identity of the characters reported by different workers. Jones (4) summarized published data on F₁ ratios. Single-factor ratios were reported for green × white stripe and common × glutinous endosperm. Earliness and lateness were each reported as single factor dominants. Purple color in the apiculus was controlled by two or more factors. Ramiah, et al. (9) reported clustering as a single-factor dominant. The F₁ was intermediate, and a 1:2:1 ratio was obtained in the F₂. Ramiah and Ramanujam (10) found and illustrated a green-and-white-stripe single-factor recessive mutant, which probably was identical with the one reported here. Ramiah (8) obtained a trimodal curve for maturity in one cross from which the earlier and later strains bred true. In other crosses multiple factors were involved and reversal of dominance occurred in certain segregating selections. Jones, et al. (5) found 3 late : 1 early, 9 late : 7 early, and multiple-factor ratios.

Linkage between apiculus color and endosperm type was first reported by Yamaguchi, according to Matsuura (7). Yamaguchi also found a maturity factor in this linkage group, the order being apiculus—endosperm—maturity. Chao (1) assigned a factor for tawny glume color and one for leaf sheath color to this linkage group.

Published May, 1940