

[02]イネにおける3染色体植物の，連鎖研究への利用 に関する基礎的研究

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XIII Summary

The primary function of this paper is, intending to make clear of the linkage relation between genes by using trisomic plant of rice, to aim at the identification of twelve kinds of primary trisomic plant that is expected in rice, to hold morphological and physiological peculiarities of the primary trisomic plant, then to offer the basic data to develop the further studies of linkage efficiently.

The lineage of trisomic plant used in this study was progeny of semi sterile or high sterile containing reciprocal translocation of atomic bomb exploded rice, with rather complicated composition of genetic and chromosome content. We examined them to classify trisomic plant lineage, which was supposed to be primary among 38 lineages, into 7 types: Triplo-1 (semi- rolled leaf), 2(dark green), 3(dwarf), 4(virescent), 5(slender), 6(needle-like leaf), and 7(stiff leaf). Investigation of chief characteristic peculiars of these lineages such as culm length, ear length, ear number, leaf character, and grain (unhulled) character resulted in the recognition on different characteristic peculiars in each type. We are inclined to attribute the cause to the difference of extra chromosome of each type.

As a result of the investigation of the mechanism of transmission and the variation of transmission rate of extra chromosome, small pollen ($n+1$) is defeated in certation on account of pollen tube's extremely slow elongation, therefore extra chromosome was not transmitted to the next generation by pollen, and extra chromosome's transmission rate was varied by circumstances. Then the existence of disomics chimera was indicated in individual.

Investigating morphological and physiological peculiars of trisomic plant's growing period, the following results were obtained. (1). The seed of trisomic plant germinated irregularly and the seed of slow germination generally belonged to the trisomic plant. Pursuit of the causes of this slow germination indicated abnormal slowness in the process of water absorption, and relative loss of Amylase potential in the first stage of germination. (2). The seedlings of the seed of trisomic plant grew irregularly and most of low plant were trisomic plant. Then it was seen that scrutiny of the particular seedlings in each form about spreading angle, color and width of primary leaf brought the potential of early differentiation. (3). Trisomic plant was inferior in tillering and its ear was little. In the case of varied condition of cultivation, it was clear that tillering variation was seen a little without much effect, and that weak plant such as trisomic plant was oftentimes withered by the use of 2.4.D. (4). Comparing to normal disomic plant, trisomic plant's heading and flowering were slow, and its slowness was varied by type. Ear arrangement between and among plants were inferior. (5). Comparing to normal disomic spikelet per panicle and fertile seed per panicle were less, and tertiary trisomic plant was much inferior.

Thus we indicated the physiological and morphological characteristics of trisomic plant especially primary seen in the late generation of atomic bomb exploded rice, such as slow germination, characteristic and early differentiation in the seedlings stage, abnormal tillerings, slow heading and flowering, inferior fertility, which are problems on the study of linkage analysis of trisomic plant, and concrete measures to cope with them were made clear.