SHORT COMMUNICATION

DIHAPLOID-BC PLANTS PRODUCED IN F1 PLANTS BETWEEN SYNTHESIZED AMPHIPLOID (BBCC) AND DIPLOID (BB)- OR TETRAPLOID (BBCC)-ORYZA PUNCTATA KOTSCHY EX STEUD.

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From morphological characteristics, Richiharia (1960) and Sampath (1963) postulated that the B and D genomes in the genus Oryza are only variants of the C genome, which genomes are almost similar, differing in only a few loci. A similar assumption was also presented by Gopalakrishnan (1962). Wuu et al. (1963) and Li et al. (1963) proposed that the majority of bivalents which was observed at MI of the F1 plants of O. minuta J. S. Presl ex C. B. Presl (BBCC) X O. brachyantha A. Chev. et Roehr. (FF), O. australiensis Domin (EE) X O. minuta (BBCC) and O. paraguaiensis Wedd (CCDD) X O. australiensis (EE), came from autosynthesis of the BC genomes of O. minuta or the CD of O. paraguaiensis.

However, in the backcross progenies of two intergenomic hybrids, (A X BC) X A and (A X CD) X A, there were cytogenetical evidences showing that there was mostly no homology between the B, C and D genomes (Morinaga and Fukushima 1956; Katayama 1967). Moreover, one of the present authors could not obtain the results which support the homology between the B and C genomes from the cytogenetical investigations of the F1 plant of O. punctata Kotschy ex Steud. (2x, BB) X species with the C genome (Katayama and Ogawa 1974; Ogawa and Katayama 1974).

The best understanding of the interrelationships of the three genomes, B, C and D, will be obtained from the studies on the dihaploid-BC and/or -CD plants.

Fortunately, in 1976, three dihaploid-BC plants (F1B-2x, F1J-2x-1 and F1J-2x-2) with 24 chromosomes in somatic cell were obtained from one set of twins and one set of triplets (one from the twins and two from the triplets) as shown in Table 1 and Figs. 1 and 2a. The twins were found in the F1 plant of synthesized amphiploid (BBCC, 4x-3) X O. punctata (4x, BBCC, W0015), and the triplets in the F1 plant of synthesized amphiploid (BBCC, 4x-3) X O. punctata (2x, BB, W1515) as presented in Fig. 1. The synthesized amphiploid, 4x-3, were artificially induced with colchicin treatment of the sprout from the diploid F1 plant (F1480) of O. punctata (2x, BB, W1515) X O. collina (Trimen) Sharma et Shastry (Ceylonese officinalis, 2x, CC, W0006) as reported already (Katayama and Ogawa, in press).
Chromosome configurations at MI of PMCs in both the tetraploid plants (F1B-4x, F1J-4x) were similar to those of the synthesized amphiploid (4x-3) as shown in Table 1 and Fig. 2b. In the dihaploid-BC plants (F1B-2x, F1J-2x-1), the number of bivalents at MI of PMCs ranged from 0 to 6 with a mean of 2.38 in F1J-2x-1 and 0 to 4 with a mean of 2.15 in F1B-2x. The chromosome configurations of the dihaploid-BC plants were also similar to those of F1480 as given in Table 1 and Fig. 2c. Niizeki (1977) also produced a dihaploid-BC plant from O. punctata subsp. Schweinfurthiana (4x, BBCC) by treatment with p-fluorophenyl-alanine. The results of cytogenetical observation showed a good agreement with those of the present investigation.

The morphological characteristics of the dihaploid-BC plants (F1B-2x, F1J-2x-1 and F1J-2x-2) were similar to but smaller than the tetraploid plants (F1B-4x, F1J-4x) as shown in Table 2 and Figs. 2-d and -e.

The present result and those of others (Morinaga and Fukushima 1956; Katayama 1967) suggest that there is mostly no homology between the B and C genomes.
Fig. 2. Somatic chromosomes, chromosome configurations and adult plants of dihaploid-BC and tetraploid plants. 

Table 2. Morphological characteristics of dihaploid-BC and tetraploid (BBCC) plants

<table>
<thead>
<tr>
<th></th>
<th>Flag leaf</th>
<th>2nd leaf</th>
<th>3rd leaf</th>
<th>Awn</th>
<th>Spikelet</th>
<th>Habit</th>
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<tbody>
<tr>
<td></td>
<td>Length (cm)</td>
<td>Width (cm)</td>
<td>Length (cm)</td>
<td>Width (cm)</td>
<td>Length (cm)</td>
<td>Width (cm)</td>
</tr>
<tr>
<td>F₁J-2x</td>
<td>20.7</td>
<td>1.7</td>
<td>32.7</td>
<td>1.7</td>
<td>37.0</td>
<td>1.1</td>
</tr>
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<td>F₁J-4x</td>
<td>20.5</td>
<td>1.7</td>
<td>36.5</td>
<td>1.5</td>
<td>50.5</td>
<td>1.2</td>
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LITERATURE CITED


