On a Matroclinous Plant Appeared from the Crossing,
Brassica oleracea L. $\times$ *B. pekinensis* RUPR.

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Among the interspecific hybrids *Brassica oleracea* L. var. Yōshinkanran ($n=9$) $\times$ *B. pekinensis* RUPR. var. Nozakihakusai ($n=10$) which embryos were cultured with White's media in spring of 1962, there was a plant which outer characters were very matroclinous but somewhat more rigid and dark-green than her mother plant (Figs. 1, 2, and 3.)

Fig. 1. Gametic chromosomes of parents. $\times$ ca. 2,000

a. *B. oleracea* ($n=9$)

b. *B. pekinensis* ($n=10$)

Fig. 2. a. *B. oleracea* b. Matroclinous hybrid c. *B. pekinensis*

After cytological investigations it has been proved that this matroclinous hybrid had 46 somatic chromosomes instead of expected number 19 (Fig. 4).

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Fig. 3. Shapes of leaves. a. *B. oleracea* b. Matroclinous hybrid
c. Hybrid ($2n=19$) d. *B. pekinensis*

Fig. 4. Somatic chromosomes of matroclinous hybrid. $\times$ ca. 3,000
a, b. in corolla tissue $2n=46$

Thinking from the matroclinous morphology, it may be assumed that this extra 27 chromosomes are due to quadruplication of maternal set and genomic constitution may be represented as BCCCC (after MORINAGA 1929).

Detailed configurations of chromosome association in MI of this plant could not be examined. So far as observed, a rather few chromosome number in MI was about 17, and the maximum number of univalent scattered out of equatorial plate was 6 (Fig. 5).

Pollen fertility with aceto-carmin was about 60% (Fig. 6), but seed fertility was very poor as Table 1 shows.

In Cruciferae, the cases of the duplication of maternal chromosome set by inter-specific or intergeneric crossing have been reported at *Brassica campestris* $\times$ *B. oleracea* (U 1935), *B. oleracea* $\times$ *Raphanus sativus*, *R. sativus* $\times$ *B. campestris* (U, MIDUSIMA and SAITO 1937). But the case of quadruplication of maternal set is not yet reported. But

SHIMOTOMAI (1933) has reported that each F_1 plant raised from the crossings, *Chrysanthemum Makinoi* ($n=9$) $\times$ *Ch. japonese* ($n=27$), *Ch. Makinoi* ($n=9$) $\times$ *Ch. Decaisneanum* ($n=36$),

Fig. 5. Chromosomes in meiosis of matroclinous hybrid. $\times$ ca. 2,000
a, b. Polar view in MI (chr. no. = about 17).
c. side view in MI d. 20:26 distribution in TI

Fig. 6. Pollen. $\times$ ca. 100
a. *B. oleracea* b. Matroclinous hybrid
c. *B. pekinensis*

Table 1. Results of bud pollination

Combination of parents	No. of buds pollinated	No. of perfect seeds obtained*
Matroclinous plant × <i>B. pekinensis</i>	14	9
Matroclinous plant × <i>B. oleracea</i>	14	0
Selfing of matroclinous plant	50	21

* An ovary of this matroclinous plant has about 30 ovules.

Ch. Makinoi ($n=9$) × *Ch. pacificum* ($n=45$), had increased chromosome number as many as 27 more than expected numbers. About chromosome increasing mechanism SHIMOTOMAI (1933) described, "Man muss allenfalls annehmen, dass sich hier die Chromosomen aus der mütterlichen Art noch einmal, also in ganzen je zweimal mehr längsweise gespalten hatten. Es schien mir als ob die obige Annahme tatsächlich zutreffen können." Also with this *Brassica* matroclinous hybrid, the chromosome increase may be caused by repeated longitudinal splittings of maternal chromosomes in the 1st cleavage of hybrid zygote.

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種間雑種「甘藍 *Brassica oleracea* L. ($n=9$) ♀ × 白菜 *Brassica pekinensis* RUPR. ($n=10$) ♂」にあらわれた傾母個体について

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胚培養によつて育てた種間雑種「甘藍 *Brassica oleracea* L. ($n=9$) ♀ × 白菜 *Brassica pekinensis* RUPR. ($n=10$) ♂ の中に1個体甚だ傾母的の外見を呈するものがあった。検鏡の結果この個体は $2n=46$ の染色体を有し

「BCCCC」のゲノム構成をもつものと推定された。授精後第1回の細胞分裂の際母方染色体が続いて2回均等分裂を重ねその結果この様な異質5倍性傾母個体ができただけではないかと考えている。