(2) Females y/y;C(2L)RM4,dp;C(2R)RM4,px were crossed to C(2L)P4,+;C(2R)Pr,+ males (Chadov and Podoplelova, in press). They produced, among others, 123 individuals resulting from the nondisjunction of matroclinal dp and px compounds. 49 of them arose from double aneuploid oocytes: 32 of XX type and 17 of C(2L);C(2R) type. Oocytes of XX;C(2L);C(2R) and 0 types were absent. One can suppose that the formation of double aneuploid oocytes is a result of pairing between the autosomal compounds and X's.

In both cases the conjugation of the X chromosomes was not purposely disturbed, but a part of them was involved in pairing with autosomes. The frequency of X-2 pairing is nearly 1% in the first genotype and 8% in the second. According to Weinstein's data nearly 5% of X's are non-crossovers even if they are structurally normal (Weinstein 1936). Probably, these X's have taken part in the nonhomologous pairing. However, in the second genotype the frequency of nonhomolog pairing is higher than the 5% level. It is not ruled out that some crossover X's could be involved in nonhomologous pairing with autosomal compounds. Recent data concerning spontaneous formation of half-translocations in y/$\overline{XY}$;C(2L);C(2R) females showed that some of them arising as a result of $\overline{XY}$-C(2L) interchanges are X crossovers (Chadov and Podoplelova, in press).

The data obtained, from the methodical point of view, show that the registration of double aneuploid gametes is a simple and sufficiently sensitive test for the presence of nonhomolog pairing. In principle, it makes possible the study of this process also in structurally normal genotypes.

References: Chadov, B.F., E.V. Chadova and A.K. Gaponenko 1970, Genetica (Rus) 6(10): 79-91; Chadov, B.F. and M.L. Podoplelova, Genetica (Rus) in press; Weinstein, A. 1936, Genetics 21:155-199.

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Intrachromosomal effect of a heterozygous tandem duplication.

The tandem repeat chromosome Dp(1;1)Gr, $y^2$ sc ($w^-$ spl $sn^3$)($w^c$ $sn^3$), which duplicates approximately one quarter of the euchromatic part of the X-chromosome (3A2-3;8B4-C1), was checked for an introchromosomal effect (reviewed by Lucchesi 1976) on the v - f and f - car region. Dp(1;1)Gr is homozygously and hemizygously lethal (Kalisch 1973). Crossover values are decreased within and adjacent to the duplication (Kalisch 1975). Exceptions come from patroclinous males and intrachromosomal exchanges between the two parts of the tandem repeat after double loop pairing (Kalisch 1976).

Data of experiments no. 3 and 4 in Table 1 show that the crossover decrease in region 1 is accompanied by a significant crossover increase in regions 2 and 3. The long distance between vermilion (33.0) and forked (56.7) as well as the values of regions 1 and 3 suppose that the crossover value of region 2 could be composed of a decreased value near vermilion and an increased one in the rest of the region. Table 2 shows a comparison of the intrachromosomal effect in different X-chromosomal chromosome mutations on the f - car region. Surprisingly there is neither a correlation between the genetic length nor between the crossover reduction in the distal part (y-v region) and the strength of the intrachromosomal effect on the proximal part of the euchromatic chromosome region (f - car region). The simultaneous effects of the heterozygous Dp(1;1)Gr chromosome (intrachromosomal effect) and of two heterozygous inversions in the autosomes (interchromosomal effect) on the f - car region have also been tested. The data of the experiments no. 2, 4, 5 and 6 in Table 1 show that the simultaneous effects are in the range of the summation of the two separate effects (90.63 ± 47.98 : 157.51).

Table 1. Intrachromosomal effect of heterozygous Dp(1,1)Gr females. Exceptions among the $F_1$ males (patroclinous males and intrachromosomal exchanges; Kalisch 1976) are not listed, but included in the data. The numbers in parentheses are quotients obtained by dividing the finding for that region by the finding for that region in the control.

| No. | Genotype of P-generation* | Number counted | Crossover units: Region 1 y - v | Region 2 v - f | Region 3 f - car |
|---|---|---|---|---|---|
| 1 | y v f/+ x y v f/Y | 5,078 | 23.95 ± 0.59 | 22.65 ± 0.58 | |
| 2 | f car/+ x f car/Y | 9,290 | --- | --- | 6.19 ± 0.25 |
| 3 | Dp(1;1)Gr, $y^2$sc/v f car x y v f/Y | 1,439** | 9.68 ± 0.77 (40.41) | 29.27 ± 1.19 (129.22) | 11.19 ± 1.33*** (180.77) |
| 4 | Dp(1;1)Gr, $y^2$sc/f car | 4,803** | --- | --- | 11.80 ± 0.46 (190.63) |
| 5 | f car/+;SM1/+;TM2/+ | 3,567** | --- | --- | 9.16 ± 0.48 (147.98) |
| 6 | Dp(1;1)Gr, $y^2$sc/f car;SM1/+;TM2/+ | 1,286** | --- | --- | 15.94 ± 1.01 (257.51) |

* Dp(1;1)Gr chromosomes are additionally marked by ($w^-$ spl $sn^3$)($w^c$ $sn^3$) within the duplication. Females of exp. no. 4-6 were crossed to v $f^{36a}$ car males.

** Data collected from single and mass cultures.

*** From 554 $F_1$ males.

Table 2. Comparison of the intrachromosomal effect by two heterozygous X-chromosomal inversions (data from Grell 1962) and by heterozygous Dp(1;1)Gr females (Table 1, exp. no. 4) in the f - car region.

| | Cytological position and length | Map length* | Region**: y - v | f - car |
|---|---|---|---|---|
| In(1)$sc^7$/+ | 1B4-6;5D3-6 | ∿ 13.7 % | 23.2 % | 144.0 % |
| In(1)65/+ | 1C;10B | ∿ 34.0 % | 0 % | 140.5 % |
| Dp(1;1)Gr/+ | 3A2-3;8B4-C1 | ∿ 26.0 % | 40.4 % | 190.6 % |

* Within the limits of the chromosome mutation in normal sequence X-chromosomes.

** Percent value for each region is the quotient obtained by dividing map length for that region in heterozygous females by map length for that region in the control with normal X-chromosomes.

References: Grell, R.F. 1962, Genetics 47:1737; Kalisch, W.-E. 1973, Chromosoma 41:237; ____ 1975, Theoretical & Applied Genetics 46:169; ____ 1976, Genet. Res., Camb. 26:275; Lucchesi, J.C. 1976, In: The Genetics & Biology of Drosophila, Vol. 1a:315 (Academic Press, New York).