Sobels, F.H. University of Leiden, The Netherlands. The viability of II-III translocations in homozygous condition.

For insect irradication programs, the possible advantage of partial sterility resulting from translocations (over complete sterility, as achieved by the sterile male technique) are now being considered. Since in these species, inversions for balancing translocations are not readily available, large scale breeding of individuals with translocations depends on their homozygous viability. With the exception of Ytterborn's (DIS 45:158, 1970) data, little is known about the viability of translocations in homozygous condition.

For that reason homozygous viability of a number of translocations that had been obtained in experiments on the interaction of breaks induced in different stages of spermatogenesis was determined. Males heterozygous for a II-III translocation and the markers bw and st p^p were mated to females of the genotype yw^- spl sn^2;Lyu/TM3 Sb Ser. The presence of p^p in TM3 enabled recognition of the desired genotypes, so that flies heterozygous for the translocations and the third-chromosome balancer could be mated to each other. In total 256 different translocations were tested, out of which only 135 could be bred through the successive generations required for the test. Out of these, 84, that is 62.2%, were lethal when homozygous. The weighted mean for the induced translocation frequency in these experiments was 7.0%. On the basis of earlier results (Sobels, Mutation Res. 8:111, 1969) this translocation frequency would correspond to 7% recessive sex-linked lethals, and it is assumed that about four times as many lethals are induced in the major autosomes. This would mean then that about 28% of the lethality can be attributed to recessive lethals in the second and third chromosomes and little over one half of the total lethality observed, results from the translocations per se. This observation suggests that either deletions, or breaking up the contiguity of gene clusters or linked genes and relocating them to different sites, results in some kind of recessive lethal position effects (Muller and Altenburg, Genetics 15:28, 1930). These findings correspond remarkably well to those obtained by Ytterborn after an exposure of sperm to 2000 R, which induced a comparable frequency of translocations as observed in our experiments. Ytterborn noted that out of 35 translocations, 66% were lethal in homozygous condition. Assuming that 27% results from recessive lethals, 53% of the total lethality can be ascribed to that of translocation per se.

For the possible applications of induced translocations it is of interest to conclude that at doses inducing 6.5 - 7% II-III translocations, about 53% are sufficiently fertile to be of further use and that out of these roughly 36%, or about one fifth of the total number of induced translocations, are viable in homozygous conditions.

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Miklos, G.L.G.* University of California, San Diego, La Jolla, California. Properties of males homozygous for Segregation-Distorter.

There are a number of potentially interesting problems associated with SD/SD males which have not been reported on in the past. They are presented here in case they merit sufficient interest for further pursuit by others.

1. Segregation ratios from X/y^+Y;SD-72/SD bw males. It has been found on two separate occasions that this genotype yields high recoveries of the y^+Y chromosome. The SD-72 chromosome is a standard highly distorting element used routinely, and SD bw is a highly distorting derivative of SD-72 obtained by recombination between SD-72 and cn bw. The y^+Y is also a standardly used chromosome which possesses L(L)J1$^+$ y^+ac^+ and In(1)sc^8 heterochromatin. The X's used here were structurally normal run of the mill chromosomes from shelf stocks.

The recovered gametic arrays obtained from X/y^+Y;SD-72/SD bw, X/Y;SD-72/SD bw and X/y^+Y; SD-72/In(2LR)Cy males raised at 25 and 18 degrees are shown in Table 1. At 25 degrees, the recoveries of the y^+Y in two different experiments were 0.68 and 0.72. These findings could perhaps be dismissed without much introspection were it not for the following: the original experiment was repeatable; the X chromosomes used in the two experiments were from different laboratory stocks; the same genotype was constructed using different crossing programmes; the tester females in the second experiment were of a different genotype to those in the first;