

## A test for X-ray induced translocations in spermatogonia of *Drosophila melanogaster*

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As a genetical corollary to a cytological analysis by Dr H. Slizynska (1963), published in this volume, the frequency of genetically detectable translocations was determined in spermatozoa, spermatocytes and early and late spermatogonia of *Drosophila melanogaster*.

Table 1. *The brood-pattern of recessive sex-linked lethals, translocations and induced crossing-over after irradiation of young males*

Brood	Day	Sex-linked lethals (%)	Number of translocations found and number of gametes tested						Total translocations (%)	Crossing over
			T. II-III		T. X-A*		T. Y-A*			
			Found	Tested	Found	Tested	Found	Tested		
<i>a</i>	1	11.0 ± 1.7	19	336	—	—	6	366	7.4 ± 1.4	—
			12	480	7	480	—	—	4.2 ± 0.9	—
<i>b</i>	2-5	—	—	—	—	—	—	—	—	—
<i>c</i>	5-8	—	← Sterile period →						—	Some singles
<i>d</i>	8-11	4.6 ± 1.1	1	1180	0	540	0	640	0.1	Many singles and small clusters
<i>e</i>	11-15	2.2 ± 0.8	0	1172	0	562	0	610	0.0	—
<i>f</i>	15-18	—	—	—	—	—	—	—	—	—
<i>g</i>	18-21	—	—	—	—	—	—	—	—	Large clusters
<i>h</i>	21-25	1.0 ± 0.5	0	901	0	301	0	600	0.0	—

\* 'A' stands for Autosome II or III.

*Note:* The column headed T. II-III shows the total frequencies of II-III translocations obtained in tests with attached -X and detached -X♀. In brood *a*, these frequencies were markedly different and have therefore been listed separately.

The method of scoring was designed to detect translocations involving the X and Y chromosomes and the two large autosomes. Simultaneously scored cross-overs and their occurrence as singles or in smaller or larger clusters were used for determining the germ-cell stage sampled.

About 400 two- to three-day-old males, heterozygous for *dp b cn bw*, were exposed to 3000 r. They were mated to three types of tester females:

- (1) *y sc sl In49 sc<sup>8</sup>; bw; st* for the scoring of sex-linked lethals and translocations involving Y, II and III.
- (2) Attached X; *bw; st* for the scoring of translocations involving X, II and III.
- (3) *dp b cn bw* females for the detection of induced cross-overs.

Not all tests were done on all broods. The duration of the broods and the tests carried out are shown in Table 1. Mass matings were used in the first two broods. In all subsequent broods, the males were mated singly to three females each. When no progeny had to be collected (e.g. brood *b*), OrK females were used.

The period of excessive sterility and the first occurrence of cross-overs were the diagnostic criteria used to interpret the pattern of spermatogenesis. According to these criteria, brood *c* is taken to represent cells treated in early meiosis and brood *d* the first premeiotic cells.

In agreement with the usual brood pattern, the frequency of sex-linked lethals dropped from spermatozoa over spermatocytes to early spermatogonia. Although the frequency of translocations in spermatozoa (brood *a*) was unusually low, especially in the test with attached X $\square$ , its drastic reduction in premeiotic stages is evident. Only one translocation occurred in late spermatogonia, and none in early ones. These results confirm the great rarity of genetically detectable translocations in irradiated spermatogonia.

#### REFERENCE

- SLIZYNSKA, H. (1963). Heterogeneity among spermatogonia of *Drosophila melanogaster* in sensitivity to X-rays. *Genet. Res.* **4**, 446-456.