Strangio, V. A. University of Melbourne, Australia. Brood sensitivity patterns after the irradiation of males bearing a rod, ring or inverted-X and a doubly marked Y-chromosome.

Males bearing either a rod (R), ring (X^{C2}) or inverted (M5) X-chromosome and a doubly marked Y-chromosome (B^S Y y^+) were irradiated with 800 r X-rays. Experimental and breeding protocols were as published previously (1961, 1962). Partial or complete sex chromosome loss, induced X-Y exchange and/or non-disjunction were recorded. The accompanying table shows the daily brood sensitivity patterns for some of these aberrations. In general, the sex chromosome loss patterns are comparable except for the markedly increased amplitude found in the ring-X series as expected and as previously noted by Sobels (1963). An unexpectedly high recovery of yellow-Bar females, i.e. recombinant X's from induced exchange between the inverted-X (a Barless Muller-5 chromosome) and B^S Y y^+ during a study of spermatogenic sensitivity to the induction of subterminal deletions (Lüning 1954) led to a re-appraisal of supposed non-disjunctional exceptionals from rod-X experiments (Strangio 1961), confirming studies independently undertaken by Zimmering and Wu (1964). Induced X-Y exchange is predominant over non-disjunction in both rod and inverted X experiments. This is not immediately apparent in the results given for the inverted-X which have not been adjusted here for a relatively inflated spontaneous rate of primary non-disjunction. However, the position is definitely reversed for the ring X. The dicentric configuration produced after exchange between the ring X and Y probably accounts for this situation. However, a rare rupture of this dicentric in a heterochromatic region may sometimes be followed by healing and the recovery of a monocentric recombinant X.

Table 1: Brood frequencies after the irradiation of rod (R), ring (X^{C2}) and inverted (M5) X chromosomes.

BROOD		1	2	3	4	5	6	7	8	9
Sex chromosome loss	R	0.1187	0.0634	0.1441	0.3297	0.5780	1.0419	1.6765	1.4657	0.2577
	X^{C2}			1.3390	1.6320	1.7707	4.1941	6.3018	3.4010	0.9949
	M5				0.7558	0.9196	1.2935	1.4597	1.3229	0.6394
X-Y exchange	R	0.0091	0.0000	0.0000	0.0094	0.0000	0.2368	0.6343	0.4728	0.0537
	X^{C2}			0.0000	0.0000	0.0000	0.0200	0.0237	0.0597	0.0362
	M5				0.0000	0.0000	0.1866	0.2567	0.2970	0.0246
X-Y non-disjunction	R	0.0091	0.0181	0.0303	0.0188	0.0246	0.0710	0.1812	0.0946	0.0215
	X^{C2}			0.1708	0.1533	0.1005	0.3395	0.4264	0.2983	0.1447
	M5				0.1425	0.2362	0.2574	0.3770	0.3510	0.3050

Hosgood, Sally W. M. and P. A. Parsons. University of Melbourne. Differences between D. simulans and D. melanogaster in tolerances to laboratory temperatures.

Four strains of D. melanogaster and three of D. simulans were collected in Victoria, Australia, and set up at 29.5°, 27.5°, 25°, 20° and 15°C. It was found that after 5 generations, all strains of D. melanogaster were living at all temperatures. However, at this stage the three strains of D. simulans were living at 20° and one at 25°. At 29.5° and 15° all the D. simulans strains had died out by the second generation, and at 27.5° by the third generation.

Thus D. simulans is much more restricted in its tolerance to diverse temperatures than D. melanogaster. This distinction may help to explain distribution differences in the two species. At first sight, therefore, D. melanogaster is much more versatile ecologically than D. simulans in Victoria.