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The effect of the doublesex (dsx) mutant on the action of daughterless (da) in D. melanogaster.

The gene "daughterless" (da), (Bell, Genetics 39: 958-959, 1954), is a second chromosome, recessive mutant in D. melanogaster, which in the homozygous state in the female parent results in 100% male progeny regardless of the genotype of the male parent. Primary sex ratio appears to be normal, but female progeny die before hatching. The gene "doublesex" (dsx), (Hildreth, Genetics 51: 659-678, 1965), is a third chromosome, recessive mutant in D. melanogaster which in the homozygous condition causes both XX and XY individuals to develop as intersexes. Its time of action seems to be prior to the time of anatomical sexual differentiation.

A genetic study was carried out to determine if the action of the "doublesex" gene would affect the lethality of the female progeny from the da/da female parent. The results of 15 matings are given below. A standard marked X - chromosome system was used to distinguish XY dsx/dsx progeny from XX dsx/dsx progeny.

Mating	Progeny: Male +	Female B/+	Intersex +	Intersex B/+
Bw^a/Y, da/da, Ubx/dsx X +/+, da/da, Ubx/dsx	1113	0	469	0

The lack of female progeny, as well as the lack of the B/+ intersex type, indicates that "doublesex" does not affect the expression of the "daughterless" trait. This observed non-interaction could be interpreted in two different ways. Either the effect of the "daughterless" gene occurs prior to that of "doublesex", and thus lethality of female progeny occurs before "doublesex" has had a chance to operate, or the expression of "daughterless", regardless of its time of action, is independent of the sexual anatomy, and thus independent of the action of "doublesex". Although it is not possible to distinguish between these two hypotheses at the present time, further investigation along this line may give some clue to the mode of action of "daughterless" and to the time of action of "doublesex".

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Lack of mutagenic effect of Gamma irradiated fructose solution.

An attempt was made to establish the possible mutagenic action of the radiolytic products of a Gamma irradiated (2.5 Mrads) fructose solution. For this purpose a 10% freshly irradiated solution was injected into Oregon R males that were subsequently mated to "Basc" females, in two different experiments. Adequate experimental procedures were followed to ensure that spermatogonia were tested in one case and mature sperm in the other. Standard sex-linked recessive lethal tests were done with the F_1 females.

The results, seen in the table, fail to show either a significant increase in mutation frequency over the untreated controls or significant differences between the two stages tested.

	No. chrom. tested	No. lethals	% lethals
Experiment No. 1 (Spermatogonia)			
Treated	6250	16	0.25
Control	6764	7	0.10
			P > 0.05
Experiment No. 2 (Mature sperm)			
Treated	1829	6	0.32
Control	2439	2	0.08
			P > 0.05