

Lefevre, G. San Fernando Valley State College, Northridge, California. Lethal and visible mutation frequencies.

In experiments where the frequency of sex-linked recessive lethal mutations was determined following irradiation with 4000r of male germ cells at different stages of maturity, all F females were inspected for the presence of visible changes at the y, w, v, and f loci, as well as for Notch and white-mottled mutations. Further, the occurrence of hyperploid males was noted. Altogether, 187,381 F₁ males and 194,775 F₁ females were examined, and a total of 461 visible mutants and 224 hyperploid males were found. The fertility of both phenotypically normal and mutant F₁ females was compared, as was the frequency of mutants in the fertile and sterile classes of F₁ females.

In general, the frequency of both visible mutants and recessive lethals is high following the irradiation of mature sperm in the male, somewhat lower when mature sperm are irradiated in the female, much lower when immature sperm are irradiated, but high again following irradiation of early spermatids. At the same time, sterility is highest when mutation frequencies are highest, except in the case of mature sperm irradiated in the female. There, sterility is increased although mutation frequencies are lower.

The frequencies of different categories of mutation do not all follow the same pattern. Chromosomal mutants (hyperploid males and white-mottled) are most sensitive, sex-linked lethals (a mixture of chromosomally normal and abnormal mutants) next, and male-viable y, w, v, and f mutants least sensitive to the effect of irradiating different germ cell stages. Further, visible mutants are 8 times more frequent among sterile than among fertile F₁ females.

These results indicate that differential chromosome breakage or restitution of breaks, not differential gene mutation rates, is primarily responsible for the differences in lethal mutation frequency detected at successive intervals following irradiation; the frequency of cytologically normal mutants is relatively constant. Further, chromosome mutants contribute to both inviability and sterility of F₁ females. Thus, variations in recessive lethal mutation frequencies do not necessarily reflect true differences in the mutability of different germ cell stages exposed to given doses of X-rays.

Yoon, Jong Sik and R. H. Richardson. The University of Texas, Austin, Texas. A study of the relationship between ovariole number and egg production in *Drosophila pseudoobscura*.

The variation of ovariole number and egg production was examined among four laboratory strains. Average ovariole number per ovary was constant (20.14 with range of 19.66 to 20.36) among different strains, but there was great variation among ovaries. There was

also a significant difference of average ovariole numbers among flies. Estimates of components of variance of ovariole number indicated about half as large a component among flies as within flies. During six consecutive days (8 through 13 days after eclosion), the mean egg production per female per day differed among strains, with a range of 24.22 ± 2.71 through 35.60 ± 4.18 . There was no correlation between ovariole number and egg production among strains (correlation coefficient = 0.02), while there were positive correlations within strains (average within-strain correlation of 0.44 with a range of 0.10). Apparently the strains each have a characteristic rate of oogenesis per ovariole. This rate is relatively constant within the strain and variations of ovariole numbers of flies within a strain is reflected in a similar variation in their egg production. An examination of stages of oogenesis within the ovaries of each fly confirms the synchrony among ovarioles during resting and egg-laying stages observed by Wolfsberg (1959), and further, indicates synchrony during yolk deposition between these two stages. At the egg-laying stage there are both mature eggs being laid and pre-yolk eggs, but no stages in between. The characteristic rate of oogenesis for the various strains may reflect either a difference in the lag-time between expulsion of mature eggs and initiation of yolk deposition, or a difference in the rate of yolk deposition among strains. (Supported by PHS Grants GM 11609 and 2-T1-337.)